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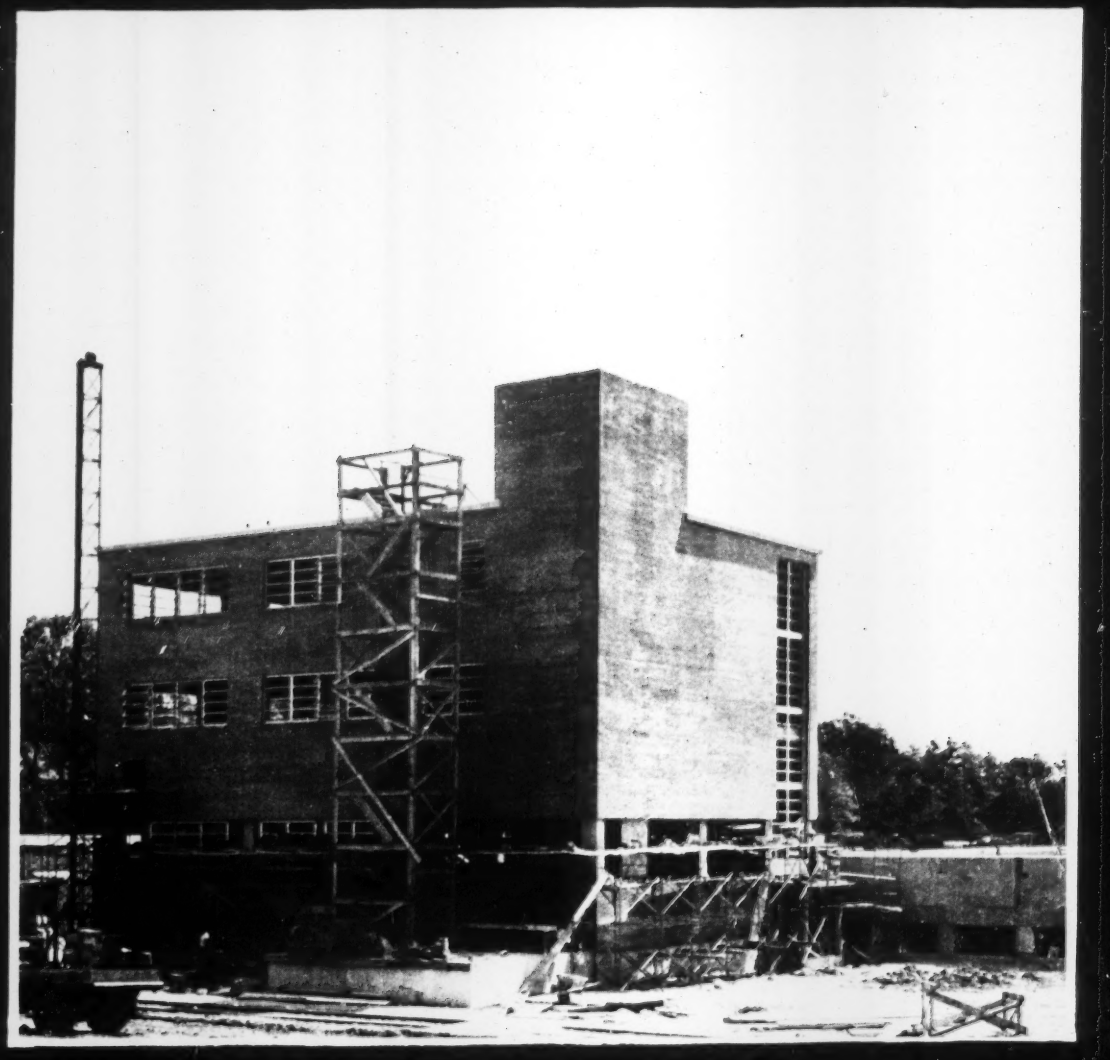

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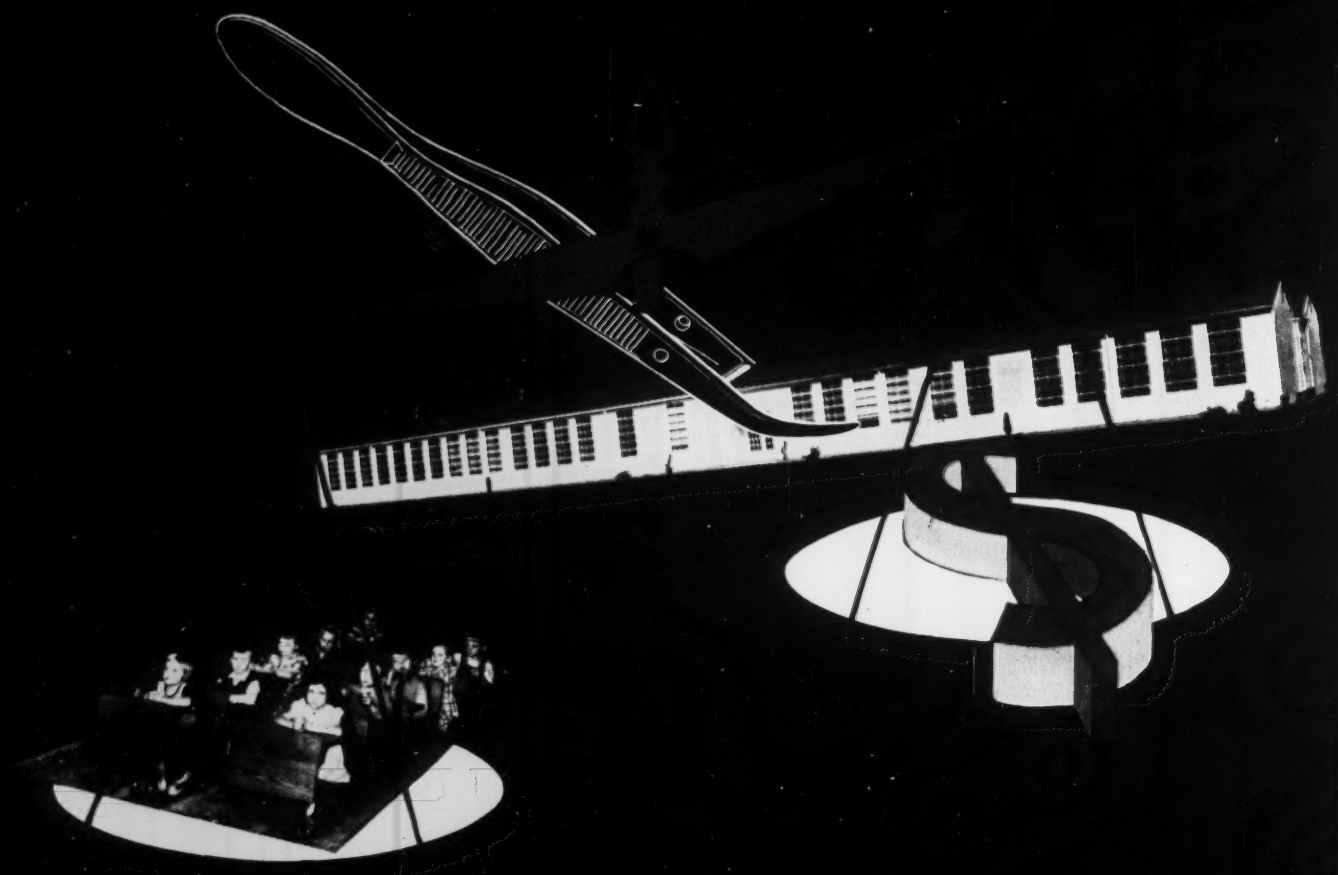

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Horizontal thrust of the hoisting pistons crowds the bucket 13" forward into the pile.

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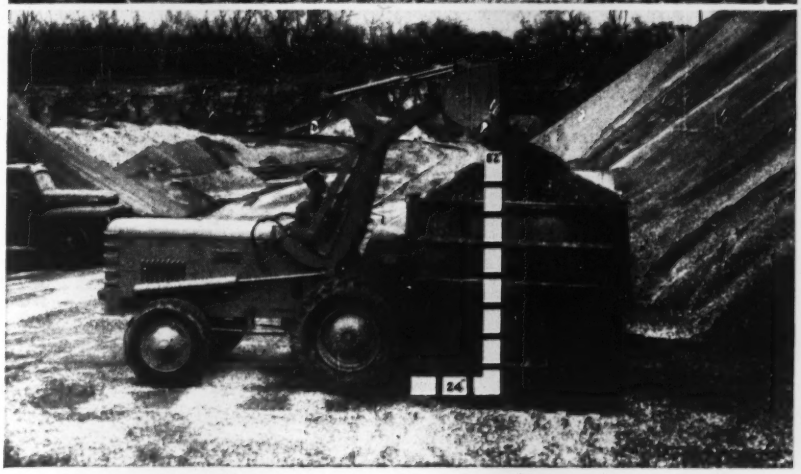

Longer reach (21"), at higher dumping clearance (8' 2" under bucket lip, 10' 4" under hinge). Boom arms and bucket under finger-tip control.

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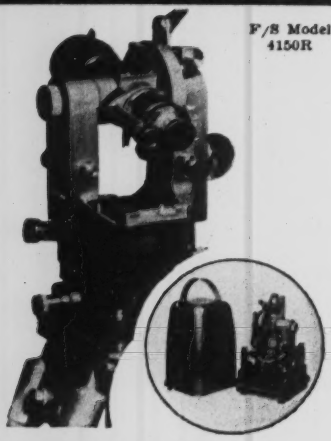

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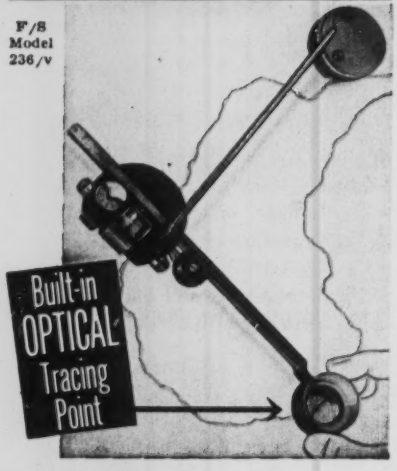

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Robert F. Boger
Publisher

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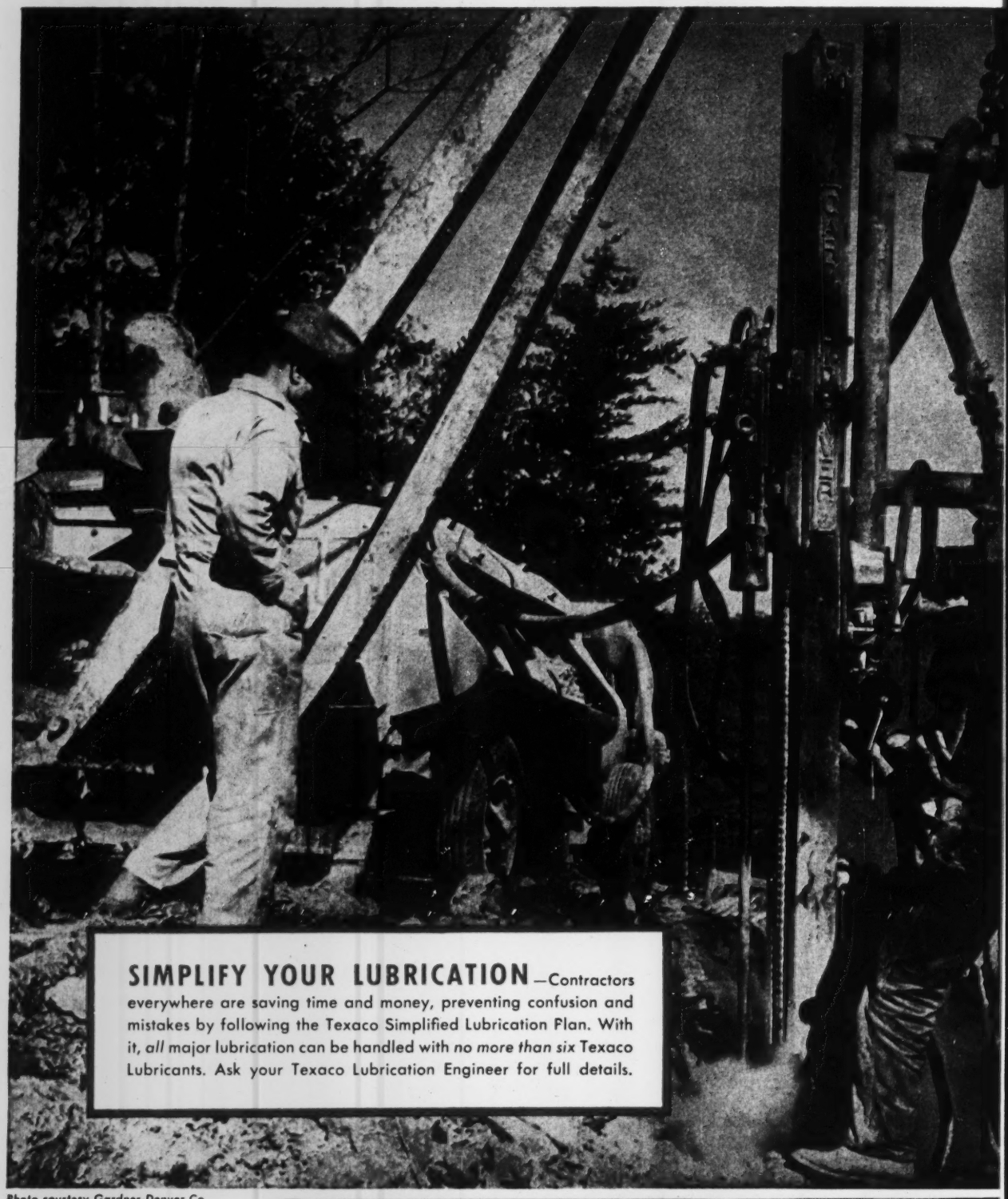

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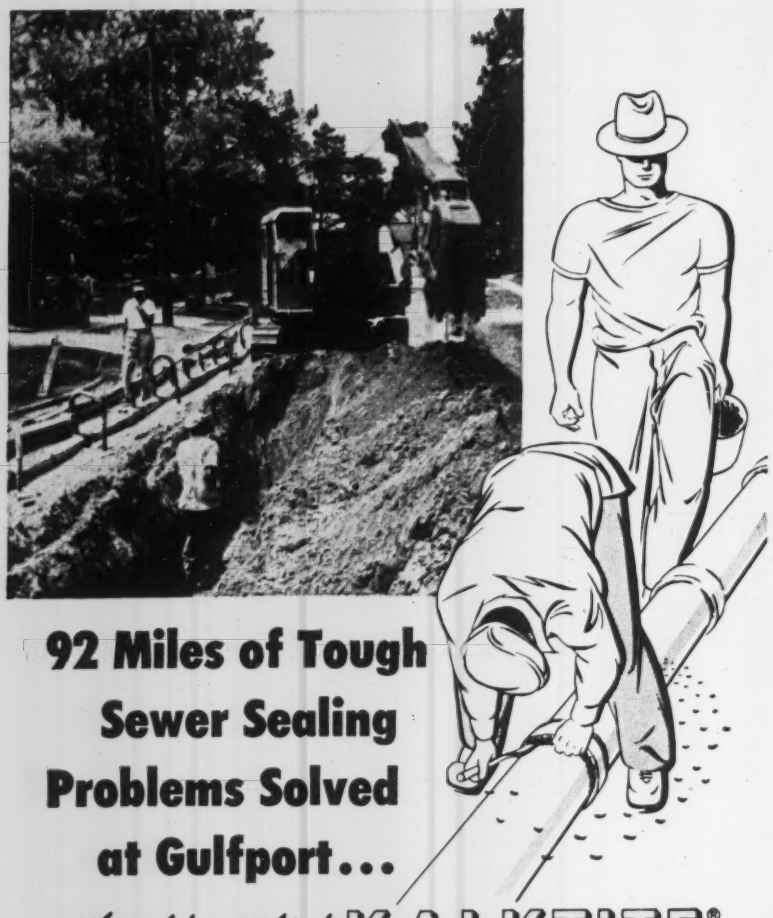

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The engineers' check for water infiltration shows the bulk of the lines have such negligible infiltration that no infiltration tests were necessary.

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READER COMMENT

Fresh water from the sea

SIR: A recent article (ENR Mar. 18, p. 71) and a later letter (ENR May 14, p. 6) concern themselves with a more accurate measurement of evaporation from fresh water lakes and reservoirs. A similar line of reasoning probably could be applied to evaporation from the sea. There is the alluring idea of building a greenhouse structure over a square mile of ocean. The structure would not be square but U-shaped in plan with both ends connected to a refrigeration plant and a battery of large suction fans on shore.

The incoming moisture-laden air would be moved into the plant by about 70 large suction fans. The moisture would be extracted by the process of refrigeration, temperature being lowered from about 90 F (arbitrarily selected) to 40 F. The other leg of the structure would handle the by-product, warm dry air. It would be fed back into the greenhouse to help pick up another load of moisture in its trip around the loop.

The first assumption is that evaporation from the sea is about the same as from a fresh water body. The second assumption is roughly that the solar ray passes through the glass roof intact, and is all used to produce evaporation. This is not precise. Only a part of the ray gets through. It produces sensible heat which is trapped inside and warms everything.

The region selected for this study was the LaJolla-Riverside area in southern California. The average annual solar radiation for a 15 year record is 562,830 Btu per sq ft per year. Latent heat is 65,146 But per cu ft.

$$\frac{562{,}830}{65{,}146} = 8.64 \text{ ft evaporation}$$

The procedures mentioned in the article cited above might cut this amount down some if refinement were deemed desirable.

A third point is that evaporation occurs mainly during the sun lighted 12 hours which is the length of an average day for a year. Then evaporation from a square mile or 27,878,400 sq ft is

$$\frac{8.64 \times 25{,}878{,}400}{365 \times 12 \times 60 \times 60} = 15.276 \text{ cfs} = \frac{30.5}{2}$$

acre-ft per ½ day— $\frac{9.87}{2}$ million gallons per half day.

If this fresh water could be delivered to the consumer in such a manner that it would be used for domestic purposes only, then consumption might be as

Aero-Commander. Seats 6. Powered by two 260-h.p. Lycoming air-cooled, geared engines.

Grumman Widgeon Conversion. Amphibious flying "office" featuring 260-h.p. air-cooled, geared engines by Lycoming.

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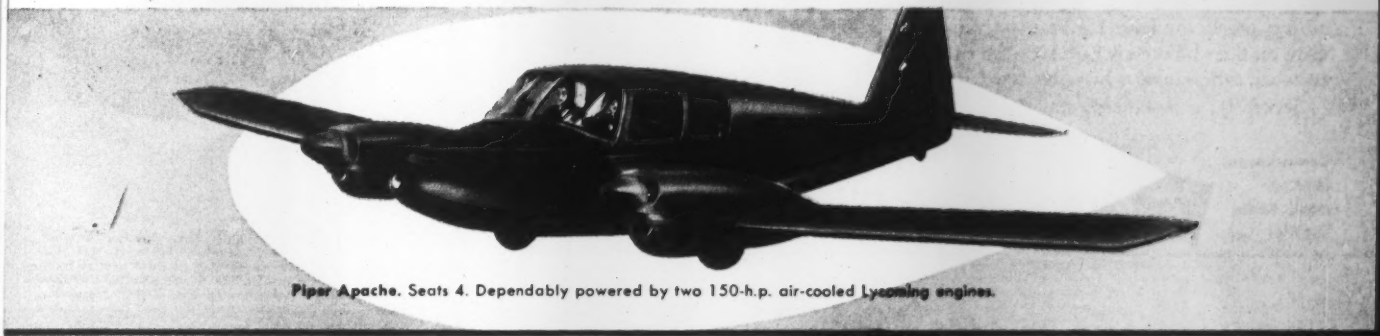
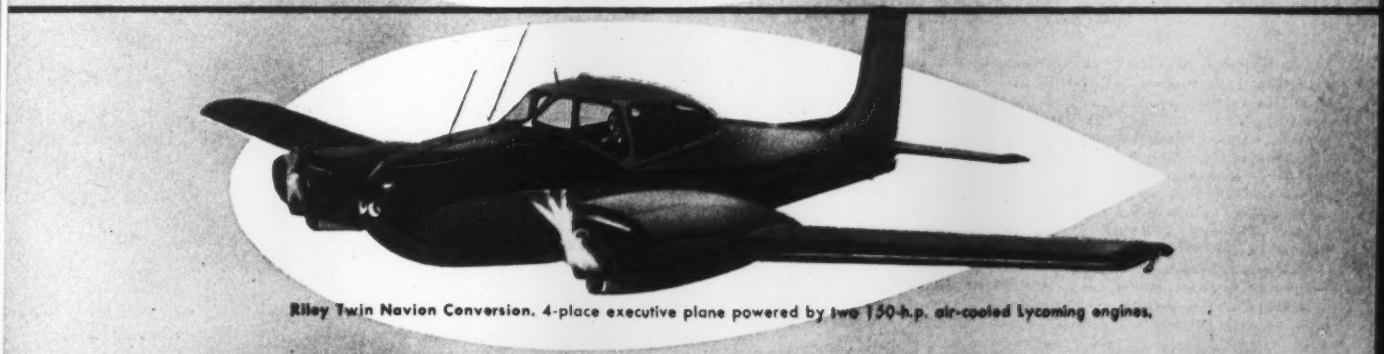


Piper Apache. Seats 4. Dependably powered by two 150-h.p. air-cooled Lycoming engines.



Riley Twin Navion Conversion. 4-place executive plane powered by two 150-h.p. air-cooled Lycoming engines.

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Secondly, attachments multiply Tractair's usefulness: With Le Roi-CLEVELAND air tools, you can break pavement, drill rock, dig clay, tamp fill, etc. With a front-end loader and attachments (8 accessories that interchange easily), Tractair loads, lifts, backfills, plows snow, etc.

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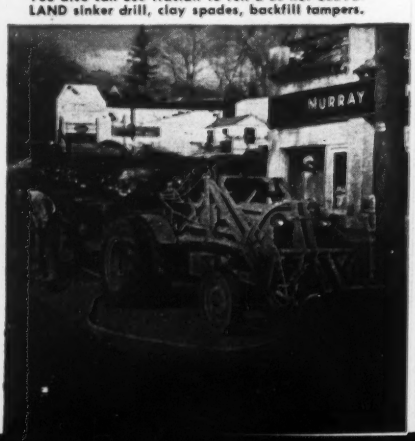
Pavement Breaking — Here, Tractair runs a Le Roi-CLEVELAND Breaker. When the job is done, Tractair mops up with its front-end loader. You also can use Tractair to run a Le Roi-CLEVELAND sinker drill, clay spades, backfill tampers.



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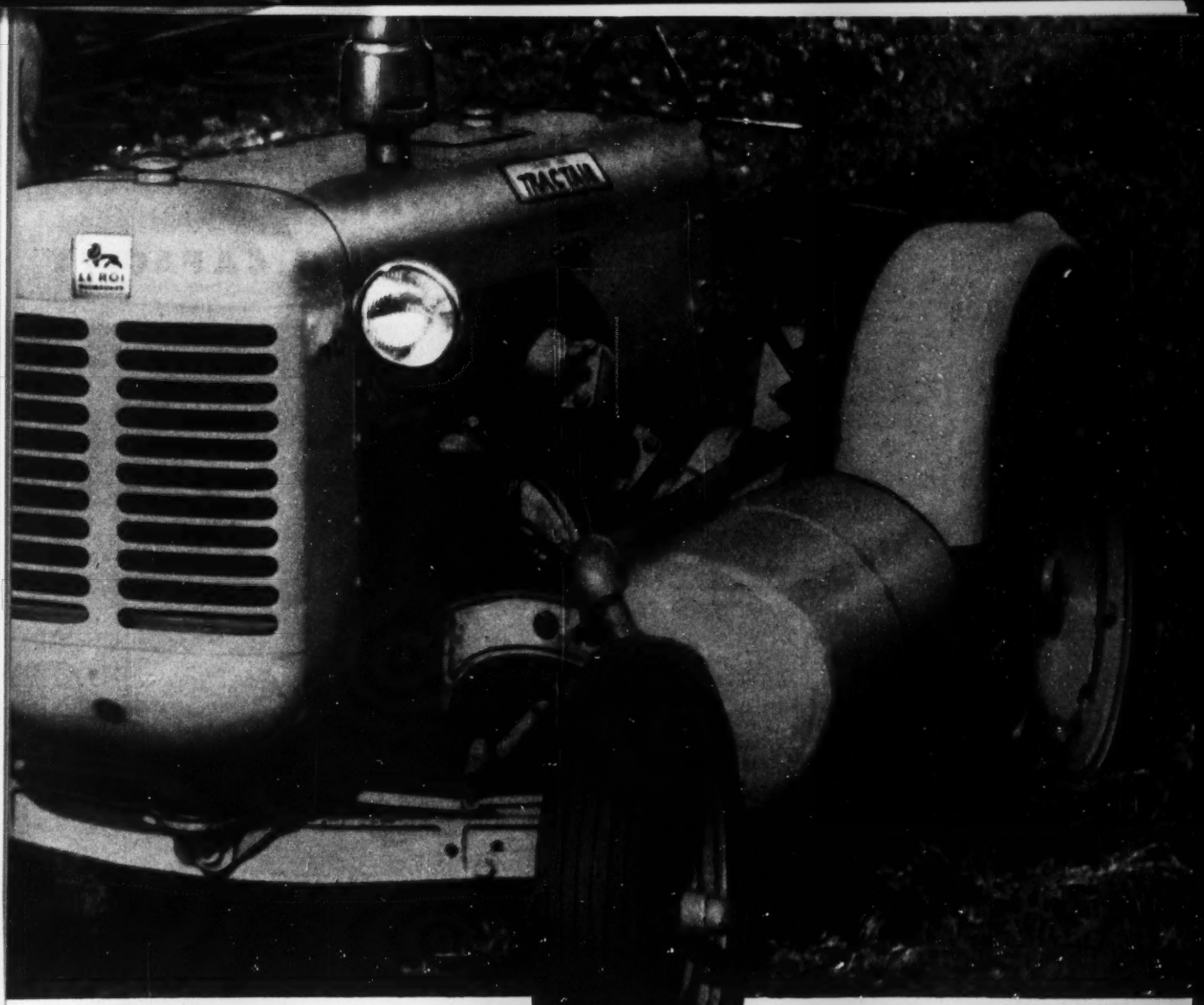

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Trac-Jac — A Le Roi-CLEVELAND air-feed sinker drill mounted on Tractair. Feeding and drilling controls are within easy reach of operator. The mobility of this unit makes it ideal for mud-jacking and many other applications.

Driving Form Pins — On this highway project, Tractair puts air power to work driving form pins prior to paving. This is another example of how the usefulness of Tractair helps you to do many different jobs, reduce costs.

Earth Drilling — Tractair with utility boom operates air-motor-driven earth auger up to 16" diameter — speeds up anchor-hole digging and other earth-drilling jobs. It's another way Tractair gives you extra hours of useful service.

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low as 50 gal per capita stored in a half day but used any time. That would supply about 100,000 people under those restrictions.

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Concrete walls and partitions 1.1 million cu yd at $25 per cu yd..	$30 million
Plant providing about 400,000 hp and operating about 70 large suction fans	$10 million
Storage and distribution of fresh water	$10 million
Total for 100,000 people	$110 million

ROBERT E. KENNEDY
U. S. Bureau of Reclamation (Retired)
Denver, Colo.

For sanitary engineers

SIR: In your story (ENR Aug. 6, p. 25) of the first meeting of the Joint Committee for the Advancement of Sanitary Engineering, several important recommendations of the committee, since released, were not reported.

In view of the broad scope of the profession of sanitary engineering, it was recommended that the American Institute of Chemical Engineers and the American Society of Mechanical Engineers nominate members to the Joint Committee. This will provide for representation of the many sanitary engineers with backgrounds in chemical and mechanical engineering and engaged in the fields of industrial wastes, industrial hygiene and air pollution control.

Since seven associations will have representation on the reconstituted Joint Committee, it was recommended that sponsorship of the Joint Committee for the Advancement of Sanitary Engineering should be made under the Engineers Joint Council. Formal request will be made through the American Society of Civil Engineers to the Engineers Joint Council for this sponsorship. Approval for this was virtually assured by the Secretary of EJC, T. A. Marshall, Jr., who was present at the Washington meeting.

Certification of sanitary engineers will be accomplished as noted in your article by a five-man certification board to be appointed by the Joint Committee for the Advancement of Sanitary Engineering and approved by the sponsors of the Joint Committee. At present this is the ASCE. But in the future this and other actions of the Joint Committee will be under the

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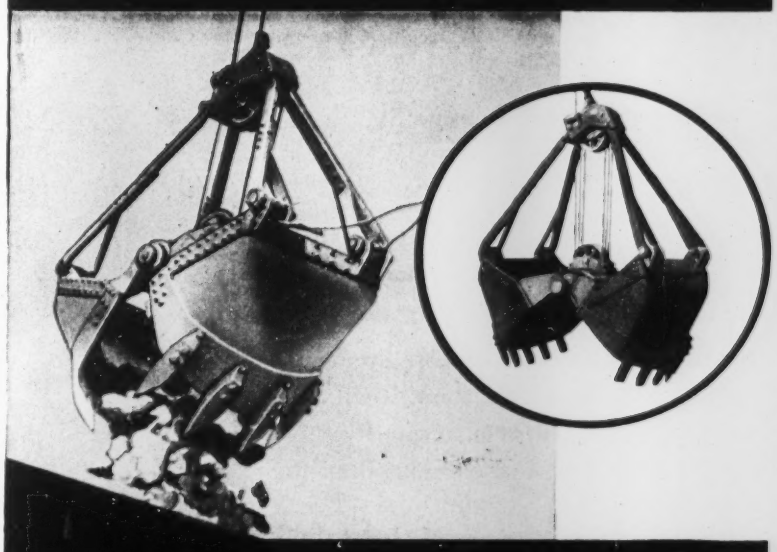

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Sounds impossible, doesn't it . . . improving the cast iron pressure pipe that has served so many communities so long and so faithfully?

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And that is exactly what today's *modernized* cast iron pipe offers the waterworks industry. Cast centrifugally for greater strength and toughness. And, where needed and specified, cement-lined centrifugally for sustained carrying capacity and freedom from tuberculation.

If you want the most efficient and economical pipe ever made for water distribution, your new mains will be laid with *modernized* cast iron pipe with either bell-and-spigot or mechanical joints. Cast Iron Pipe Research Association, Thos. F. Wolfe, Managing Director, 122 So. Michigan Ave., Chicago 3.

CAST Q IRON

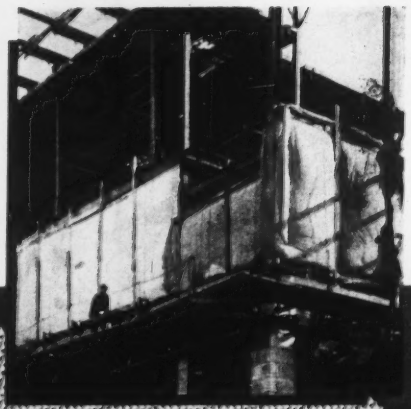
The Q-Check stencilled on pipe is the Registered Service Mark of the Cast Iron Pipe Research Association.

Modernized **cast iron**

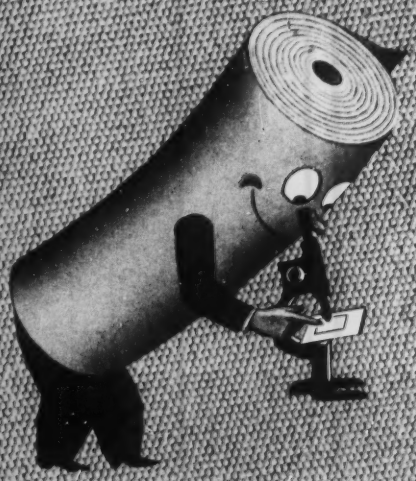
This cast iron water main, uncovered for inspection, is in good condition after 100 years of service in Alexandria, Va.—one of more than 45 cities with century-old water or gas mains in service.

pipe *for Modern Waterworks Operation*

Fabric UNIFORMITY *Makes The Big Difference In* TARPAULINS



MT. VERNON EXTRA GIVES YOU GREATER FABRIC UNIFORMITY



One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products. Here yarn number is being determined with Suter Scales.

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READER COMMENT

Engineers Joint Council, and therefore subject to the review of all the societies comprising EJC, as well as the American Public Health Association and the Federation of Sewage and Industrial Wastes Associations, both represented on the Joint Committee, but not in EJC. Thus, the Joint Committee and the Certification Board will represent and be responsible to all of the organizations to which sanitary engineers belong.

With this in mind, the Joint Committee formulated the objectives of its reconstituted organization as follows: (1) the promotion of unity in the profession of sanitary engineering; (2) the promotion of specialty board certification of applicants who qualify; and (3) the promotion of the sanitary engineering profession in its dedicated field of activity and responsibility.

ROLF ELIASSEN

Member, Joint Committee for the Advancement of Sanitary Engineering

CALENDAR

National technical conference on lighting, Illuminating Engineering Society, Hotel Commodore, N. Y., Sept. 14-17.

American Concrete Pipe Association, executive committee, Castti Harbour Hotel, Bermuda, Sept. 19-30.

National highway conference of county officials, American Road Builders Association, Lake Delton, Wis., Sept. 24-25.

National Electrical Industries Show, 69th Regiment Armory, New York City, Sept. 29-Oct. 2.

Southeastern Association of State Highway Officials, annual meeting, Asheville, N. C., Sept. 30-Oct. 3.

Conference on Radiant Heating, Department of Architecture, Pratt Institute, Brooklyn, N. Y., Tuesday evenings, 7:30 to 9:30 p.m., October-November.

Western Association of State Highway Officials, annual conference, Santa Fe, N. M., Oct. 7-10.

Western Association of State Highway Officials, Hotel La Fonda, Santa Fe, New Mexico, Oct. 7-10.

National Conference on Industrial Hydraulics, Hotel Sheraton, Chicago, Oct. 8-9.

American Concrete Pressure Pipe Association, convention and meeting, Ponte Vedra Inn, Ponte Vedra, Fla., Oct. 8-10.

Structural Engineers Association of California, The Ahwahnee, Yosemite National Park, Oct. 8-10.

Concrete Reinforcing Steel Institute, semi-annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va., Oct. 12-17.

National Reclamation Association, Mapes Hotel, Reno, Nev., Oct. 14-16.

Engineers' Council for Professional Development, Hotel Statler, New York City, Oct. 14-17.

American Society of Civil Engineers, annual meeting, Hotel Statler, New York City, Oct. 19-23.

Excessive noise symposium, Armour Research Foundation, Illinois Institute of Technology, Chicago, Oct. 23-24.

Society of American Military Engineers, semi-annual convention, George Washington Hotel, Jacksonville, Fla., Oct. 25-26.

American Public Works Association, annual public works congress and equipment show, Roosevelt Hotel and Municipal Auditorium, New Orleans, La., Oct. 26-29.

California Section, American Water Works Association, Palace Hotel, San Francisco, Calif., Oct. 27-30.

BUILD YOUR PROFITS with UNIVERSAL ADJUSTABLE STEEL POST SHORES

EFFICIENT, COMPACT DESIGN PROVIDES—

ONE MAN ERECTION

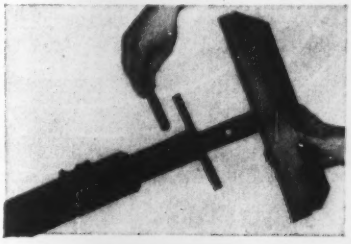
Speeds up shoring operations, eliminates cutting, wedging and costly custom-building special wood shores on the job.

TWO SIMPLE OPERATIONS

Locate shore at nearest height with attached pin. Adjust nut to the *exact height required.* Saves considerable time—vernier adjustment need not exceed 3 inches.

THREE STANDARD MODELS

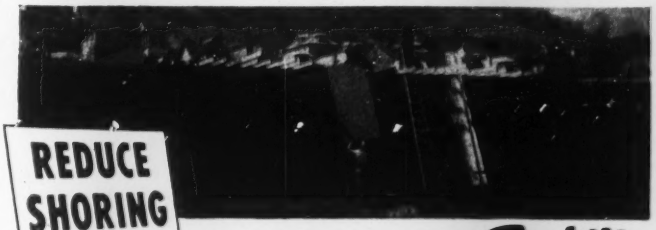
Shore every job from 6 to 15½ feet high with Universal Shores APS-610 (6 to 10′), APS-813 (8 to 13′) or APS-1015 (10 to 15½′).



CONVERT HEADS *on-the-job* IN SECONDS!

Exclusive feature meets most shoring applications—*eliminates stocking extra models with special heads.* Standard 6x6 Head easily adapted to "T" or "J" Heads quickly.

SHORE SAFELY—SAVE TIME and MATERIAL



REDUCE SHORING COSTS

Use UNIVERSAL's Ezebilt STEEL-PANEL SCAFFOLDING

Shore concrete forms safely, at any height, and eliminate intermediate decking with standard Ezebilt steel-panels. Predetermined load capacities take the guess-work out of shoring jobs, provide stable, load-bearing substructures.

Mount Ezebilt scaffold-shoring on bases to provide 16½" of adjustment and lower scaffold after slab has been poured. *Speed-up construction*—add forms immediately to each run of scaffold as the work progresses—strip forms easily, working from the "built-in" efficient work platforms.

American Tubular Elevating Towers

BETTER SHORING ON EVERY JOB WITH UNIVERSAL'S ENGINEERING SERVICE

Write for informative bulletin E-9

UNIVERSAL MANUFACTURING CORP. ZELIENOPLE, PA.

World's Largest Producer of Steel-Panel Scaffolding

I've heard about DEWEY and ALMY'S "shirtsleeves" research, but what's in it for me?

BETTER CEMENT and CONCRETE in the field ...on the job!

Dewey and Almy's pre-tested products for cement and concrete give you dependable performance, where it counts most — in the field, on the job. For each Dewey and Almy product is a result of years of down-to-earth research and field-tested quality controls.

The extensively equipped Dewey and Almy Cement and Concrete Laboratory is no "ivory tower". It is a *practical* proving ground that mirrors actual field conditions. And Dewey and Almy engineers are *practical* men with the experience to translate today's test results into tomorrow's improvements.

Get acquainted with these Dewey and Almy products. See why the leaders in the cement and concrete industries *rely* on them for their most important projects.

DAREX AEA • World's most widely used brand of air entraining agent. Concrete made with DAREX AEA places easier, finishes faster and better, has finer surface texture, is many times more durable when exposed to freezing and thawing.

AIRALON • A ready-to-use air entraining agent and plasticizer that contains all the ingredients necessary to make a superior masonry cement.

DARASEAL • Creates a "membrane" film which keeps water in newly poured concrete for better, more complete curing.

GRINDING AIDS • Catalyzing grinding aids for cement mills that increase grinding rates 15 to 50%, depending upon the type of cement.

DARACONE • Long-lived silicone water repellent for above grade exterior masonry walls. Effectively combats efflorescence and leaks without affecting the appearance or "breathing" qualities of the masonry. Easy to apply, brush or spray.

Dewey and Almy "shirtsleeves" research virtually recreates the cement and concrete industries. These cement mills evaluate hydraulic cement grinding aids.

CONSTRUCTION SPECIALTIES DIVISION

DEWEY and ALMY Chemical Company

Cambridge 40, Mass.

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THE CONSTRUCTION WEEK

- **The weather**—Here's the U. S. Weather Bureau's 30-day outlook for September, to be read with the tables that appeared in ENR's August 20 issue, page 57:

  Temperatures will average below seasonal normals over most areas west of the Continental Divide, and in states bordering the Gulf of Mexico. Prevailingly above normal temperatures are anticipated from the Ohio Valley and Great Lakes region eastward to the Atlantic Coast. Elsewhere, temperatures not far from seasonal normals are expected.

  Precipitation is expected to exceed normal over the Gulf States, Great Plains and Pacific Northwest. Subnormal rainfall is indicated for the Northeast and Southwest.

- **Signs don't stop 'em**—California's Division of Highways reached a reluctant conclusion about the state's speed-happy motorists:

  Signs won't stop them.

  At the request of the state highway patrol, the division posted—at frequent intervals—signs along the Bayshore Highway near San Francisco, emphasizing that the speed limit is 55 mph.

  After a year's experience, state engineer George T. McCoy said, somewhat sadly: "The signs appear to have no appreciable permanent effect. In a few instances, the signs slowed traffic a fraction of a mile an hour just after they were posted. Then the speeds climbed right back up."

- **Water fight still on**—Arizona and California were before the U. S. Supreme Court this week in another round of their seemingly endless battle over distribution of waters of the Colorado River.

  Arizona centered its fire this time on a 1929 self-limitation act, in which California bound itself to take no more than 4,400,000 acre-ft of river water. California had contended that the act was forced on it by Arizona's refusal to sign a seven-state compact unless such a limitation was agreed upon. "Not so," countered Arizona lawyers, "California passed the limitation act to assume construction of Hoover Dam."

  Result: No one knows.

- **Subway engineering**—That program to be submitted to Cleveland voters for a loop subway system (see also p. 55) is the result of nearly seven years of work. Original study was made in 1946 by De Leuw, Cather of Chicago for the Cleveland Transit System. Since then, the plans have been re-worked by a local technical committee made up of Morse W. Rew, CTS chief engineer and his staff, city and county engineers, and the Cleveland and Regional Planning Commissions. CTS supplied the cost estimate, after consultation with De Leuw, Cather (though the firm was no longer officially in on the planning).

  Next step is to set up a public relations program to sell the idea to the public.

84 FLOORS concreted with 'INCOR' in 69 WORKING DAYS

Tight Schedules and Dependable 'Incor' Performance Save Time, Cut Costs to the Bone

ST. NICHOLAS HOUSES—SECTION 3
Owner: **NEW YORK CITY HOUSING AUTHORITY**

General Contractors:
C. E. YOUNGDAHL & COMPANY, INC., Long Island City
JAMES McHUGH CONSTRUCTION CO., Chicago, Ill.

Architects: **YORK & SAWYER**, New York

Structural Engineers:
SEVERUD, ELSTAD & KRUEGER, New York

Ready-Mix 'Incor' Concrete:
JAMES A. NORTON, INC., New York

● Emphasizing utmost value for the public's building dollar, the New York City Housing Authority has encouraged many advances in building techniques, outstanding among which is widespread use of reinforced-concrete-frame construction.

Recent example is Section III, St. Nicholas Houses—six 14-story-and-roof units . . . first pour, March 22, 1953, topped out June 30 . . . 84 floors concreted by C. E. YOUNGDAHL & COMPANY, INC., in 69 working days.

Maximum job speed and economy, due to tight schedules, based on dependable 'Incor'* 24-hour stripping strengths . . . engineered forms, built to closest tolerances for streamlined erection efficiency . . . expert utilization of skilled work force.

Further proof that sound planning and open-minded co-operation among Designer, Builder and Owner make it possible to obtain the fire-safety and structural soundness of concrete, at costs and erection speed which equal or beat any other type of construction.

*Reg. U. S. Pat. Off.

LONE STAR CEMENTS COVER THE ENTIRE CONSTRUCTION FIELD

LONE STAR CEMENT CORPORATION

Offices: ABILENE, TEX. • ALBANY, N.Y. • BETHLEHEM, PA. • BIRMINGHAM
BOSTON • CHICAGO • DALLAS • HOUSTON • INDIANAPOLIS
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LONE STAR CEMENT, WITH ITS SUBSIDIARIES, IS ONE OF THE WORLD'S LARGEST CEMENT PRODUCERS: 18 MODERN MILLS, 129,000,000 SACKS ANNUAL CAPACITY

Washington's interest in construction is in for a change. It will come gradually, but a switch-around seems certain.

The change is geared to a new goal—"Win in '54." This means that the emphasis and publicity on budget cutting, which has been the main line of the Republicans since January, will be soft-pedaled from here on out.

That doesn't mean the lid is off in fact, the budget to be submitted to Congress in January to cover fiscal 1955 will call for less spending than will be done this year.

But the cuts will be selected with an eye on the fall elections.

McKay, for instance, will argue for at least a token power project—to demonstrate to Western voters that the new regime doesn't mean to withdraw completely from the development of power and other resource development in the West.

Eisenhower and his team will work with congressional candidates who know the value of telling the voters what the Republican team has done for their district.

•

This fiscal year's construction expenditures will be lower than the new Administration estimated officially last January. Taking into account congressional action on appropriations, Budget Director Dodge finds that Atomic Energy Commission spending will be about $400 million less than estimated six months ago—and other "national resources" expenditures, including power, are expected to be $200 million below the first-of-the-year projections for fiscal '54.

Civil works spending for the current year will be off about eight percent from previous estimates. General Sturgis, Chief of Engineers, figures to cut previous estimate of $543 million to about $500 million (see p. 22).

Administration figures it will need another $65 million for federal aid to highways. It is going to ask for this amount in a supplemental appropriation next year. This is in addition to the $475 million voted earlier this year to pay federal government's share of highway building costs.

•

New National Advisory Commission on Housing is now a White House group. The idea was originally proposed by the Housing Administrator a couple of months ago and was to advise him on all housing matters.

The commission will have to tie in with the new Hoover Commission that is just getting under way at this time, too. The Hoover Commission's job charter in the housing field is virtually the same as the special housing commission, of which Cole will be chairman.

Advisory Commission, however, will take hold more quickly. It's findings and recommendations will bear on housing legislation next year. The Hoover Commission, on the other hand, isn't expected to report before the end of 1954.

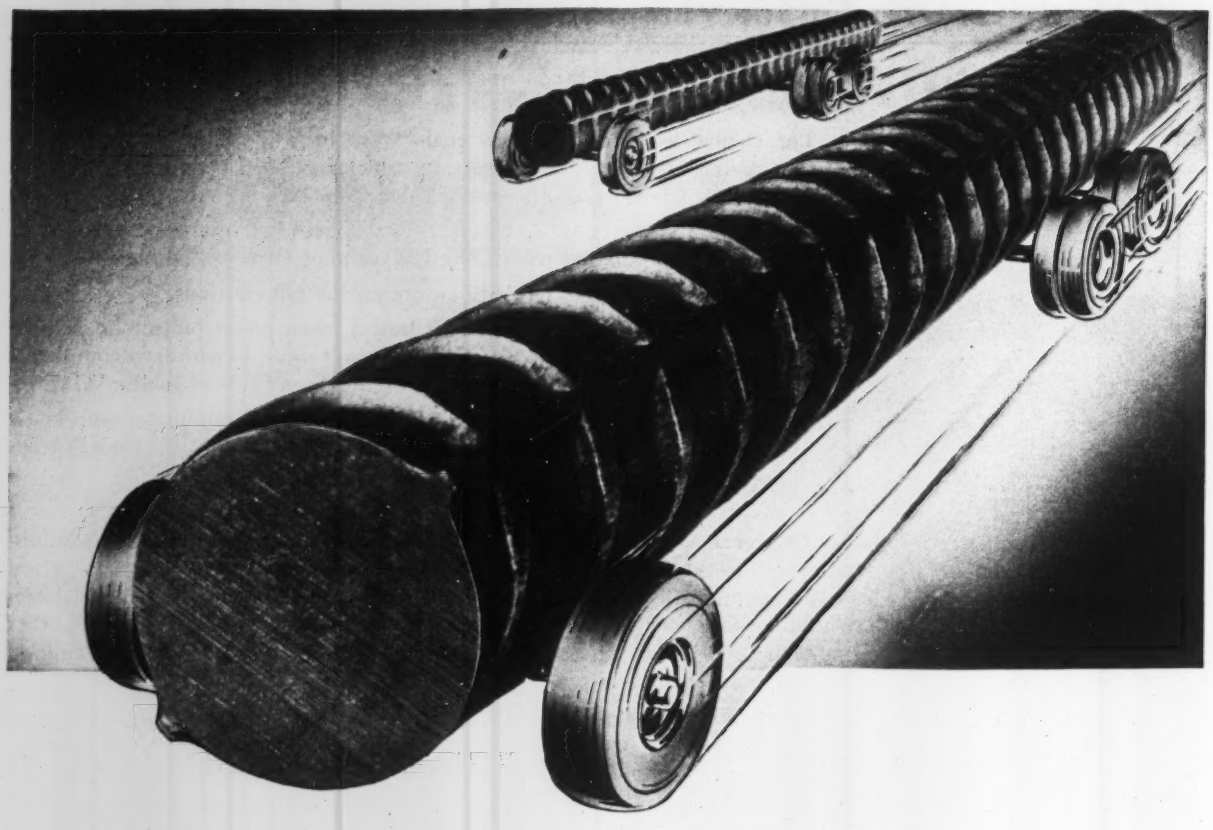
•

FHA is going to stay in the background on home "trade-ins" (see page 23). Top officials are letting the builders themselves take the lead. FHA is more than willing to go along, but it won't be the pusher or promoter.

Both builders and FHA think this is the time for a trade-in test—a time when they are not under pressure to develop devices to move new houses. A one-year test, they think, will work out any kinks.

•

Joseph Keenan, secy.-treasurer of building trades is now in the Office of Defense Mobilization as an assistant administrator. He used to run the AFL political league, which fought Eisenhower's election.



Your schedule sets the pace . . .

Ryerson Re-bars roll to meet it

You can be sure of getting your steel when you need it—no pile-ups—no delays—when you call on Ryerson for re-bar service.

Our deliveries are timed to arrive at your job as needed—to keep pours moving on schedule without costly waits or crew layoffs. And deliveries keep pace with your work—are slowed down or speeded up to meet smoothly any change in your schedule.

Ryerson reinforcing service is *complete*, too, from setting diagrams and bending details to dependably scheduled deliveries. If desired, your re-bars will be cut and bent to specifications and accurately metal tagged for quick placement.

To further simplify your purchasing, you can include all your other steel requirements with your re-bar order—reinforcing accessories, spirals, wire mesh, forms for concrete joists, structurals—construction steel products of any kind.

So, on your next job, we suggest you call your nearby Ryerson plant for lump sum or average pound prices—and then count on dependable deliveries—timed to your schedule.

Hi-Bond Re-Bars for Greater Grip

First of the new high-strength bars, Hi-Bond reinforcing gives stronger construction and increased resistance to the formation of tensile cracks. Every bar meets or exceeds ASTM spec. A. 305.

PRINCIPAL PRODUCTS: CARBON, ALLOY & STAINLESS STEELS—BARS, STRUCTURALS, PLATES, SHEETS, TUBING, MACHINERY & TOOLS, ETC.

RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT
PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Type of work	1—$1,000,000 or more			2—$500,000-$1,000,000			3—$100,000-$500,000		
	No. of consultants	No. of projects	$ volume (millions)	No. of consultants	No. of projects	$ volume (millions)	No. of consultants	No. of projects	$ volume (millions)
	1952 % change '51-'52	1952 % change '51-'52	1952 % change '51-'52	1952 % change '51-'52	1952 % change '51-'52	1952 % change '51-'52	1952 % change '51-'52	1952 % change '51-'52	1952 % change '51-'52
Heavy construction									
Waterworks	169 + 3	699 + 39	$240 − 11	48 − 17	131 + 18	$14 − 15	128 +20	206 +41	$17 +33
Sewerage	194 + 1	744 + 19	528 + 71	74 + 23	162 + 23	29 + 6	164 +21	255 +35	27 +26
Bridges	49 +32	95 + 48	419 + 82	8 +100	13 − 28	4 + 42	14 − 7	22 + 5	2 −18
Highways	106 − 5	270 + 31	772 +754	23 − 4	45 − 10	7 − 14	83 +41	118 +51	10 +32
Earthwork, waterways	44 −21	59 − 16	179 − 26	10 +900	17 +750	3 +1250	23 +44	31 +82	3 +37
Airports	129 + 1	256 − 20	303 − 55	13 + 44	12 + 9	3 − 4	30 +88	35 +67	4 +21
Unclassified	183 +23	924 +240	897 + 81	39 + 77	55 − 7	18 + 68	102 +85	118 +66	19 +69
Total	.....	3047 + 48	3336 + 44	.....	435 + 14	77 + 13	.....	785 +45	81 +35
Buildings									
Industrial	229 + 5	322 − 7	1322 − 6	46 − 18	50 − 36	18 − 29	117 + 8	126 − 1	20 −14
Mass housing, commercial and public	442 +44	910 + 57	3292 +141	107 + 10	112 + 5	49 − 9	122 + 3	114 + 8	33 − 4
Total	.....	1232 + 33	4614 + 76	.....	162 − 12	67 − 15	.....	240 + 3	53 − 8
All construction	734 +24	4279 + 43	7779 + 61	238 + 7	597 + 5	143 − 2	592 +21	1025 +32	134 +14

Note: In this count a firm doing 4 or 5 classes of work is counted in each, thus the sum of the classification counts will exceed the total number of firms shown.

Consultants' numbers rise as building work booms on

ENR survey shows number of firms in field, and size of jobs they handle increase along with continuing rise in business —atomic energy work credited with some of gain

Outrunning the contractors, percentagewise, and keeping pace with the continuing heavy increase in building construction, the number of consulting and architectural engineering firms in practice has gone up sharply, and the volume of the work they handle shows an even steeper upswing.

The figures as compiled by ENGINEERING NEWS-RECORD:

- As of the end of 1952, there were 1,564 consulting engineering firms that handled work valued at $100,000 or more, the greatest number of them in the $1-million-or-better class. That represents a gain of 20% over 1951. These firms together handled a total of 5,901 projects—a 36% rise over 1951.
- The total value of the projects handled was $8,228 million, a jump of 58% over 1951.

• Reasons—According to ENR's statistical staff the Atomic Energy Commission's heavy contract lettings during 1952—largely in building construction—plus a gain in the general building category into which ENR breaks its statistics are basic reasons for the increase in the number of consulting firms.

Of the total of $4,734 million in building projects reported by ENR for 1952, the Atomic Energy Commission accounted for nearly 40%.

It is apparent that the trend of heavy concentration on building construction continues into 1953, despite the fact that AEC contracts in fields calling for consultants have dropped. Commercial building alone (see also p. 158) is up 104% to date this year over 1952—and apparently still going strong.

• Distribution—A glance at the accompanying tables makes very clear the importance to consultants of the building work.

Biggest increase in dollar volume through 1952 was under the heading "mass housing, commercial and public"—where the $3,374-million total was up a huge 158% over 1951. That jump more than offset the slight drop in industrial construction for the year.

Heavy construction awards for '52 also held up well—at $3,494 million they were up 43% over 1951.

And again, the general continuing upward trend has held so far in 1953. In the first half of this year (ENR July 2, p. 21) total volume of contract awards was 18% ahead of 1952, and 9% over the first half of the record year of 1951.

All three groups		
No. of consultants	No. of projects	$ volume (millions)
1952 % change '51-'52	1952 % change '51-'52	1952 % change '51-'52
345 + 5	1036 + 36	$271 − 9
432 +11	1161 + 23	583 + 64
71 +27	130 + 26	425 + 80
212 + 9	433 + 30	788 +645
77 + 5	107 + 20	184 − 25
172 +12	303 − 14	310 − 54
324 +43	1097 +173	933 + 81
.....	4267 +43	3494 + 43
392 + 2	498 − 10	1360 − 6
671 +28	1136 + 43	3374 +158
.....	1634 + 22	4734 + 71
1564 +20	5901 + 36	8228 + 58

Interestingly enough, also, the greatest number of consultants were working at the two extremes of the job-value categories reported by ENR: a total of 734 of them (an increase of 24%) worked in the $1-million-and-up; class; 592 (an increase of 21%) were in the $100,000-$500,000 class.

• Comparison—Like the contractors, who show a 10% increase (ENR July 2, p. 70) in their ranks, the consulting engineers are finding more competition in their work.

Bound by their professional code in most cases, they cannot answer the competition by closer bidding, shaving profit margins or by other devices open to the contractors.

Instead, the consultants told ENR, they have found themselves working harder than ever to establish their professional reputations and abilities—and to provide greater service.

Army orders cutback in civil works spending

The Chief of Engineers, U. S. Army, has ordered a $323-million cutback in expenditures for civil works—including the flood control and rivers and harbors program.

Specifically, Maj. Gen. S. E. Sturgis has ordered division engineers to cut spending for the fiscal year 1954 to $500 million, despite the fact that a total of $823 million is available through appropriations and unexpended funds. The cut would be 35% below funds available. Cuts will be made, Sturgis' office said, on a broad basis, with complete impartiality.

Effect of the order, observers said, would be to force a restudy and rescheduling of work on rivers and harbors, navigation and flood control.

Pennsylvania puts sales tax on building materials

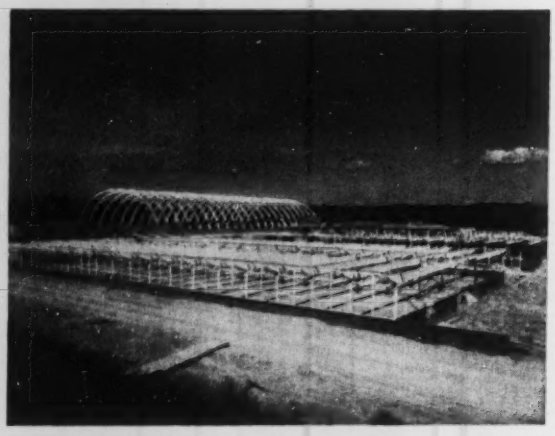
The Pennsylvania Sales Tax Bureau said last week that the state's new one percent sales tax applies to all building materials purchased by contractors.

The tax—effective Sept. 1—exempts materials used in "manufacturing tangible personal property." But the tax bureau held that a contractor produces real estate, not personal property, and according to this interpretation is therefore subject to the tax.

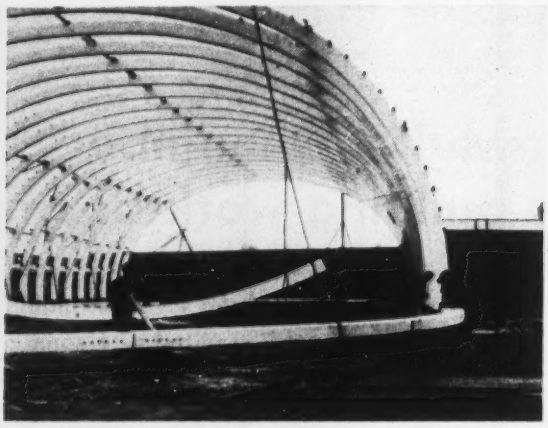
Set national conference to discuss road needs

Alarmed at growing costs of needed highway construction and improvement work, the U. S. Chamber of Commerce said it would hold a National Highway Conference at Washington, D. C., Dec. 8-9.

A chamber announcement said that the conference would "develop definite recommendations" as to how the U. S. highway program can be financed, what role the federal government should play in supplying funds for highway work, and what should be done about recent proposals to give to the states all tax receipts on per-gallon sales of gasoline and oil.



A MODULAR DESIGN, and wood construction, achieved savings of 15% on this junior high school near Seattle.



THE ARCH IS ASSEMBLED on the ground, soon will be lifted into place.

Wood techniques bring in low-cost school

Prefabrication and glued lamination are credited by Architects William Arild Johnson and Harry E. Botesch of Everett, Wash., with building a $1,110,000 junior high school at nearby Lynnwood for the low cost of $10.83 a sq-ft, including taxes, fees, black topping and a fire hydrant system.

The 39-classroom structure, to accommodate 1200 students, is believed by Johnson to be the largest building in the country using glued laminated arches and beams. Construction began last April and is scheduled for completion next March, with the Newland Construction Co. of Everett holding the general contract.

The 115,000-sq ft building is laid out on a 4-ft grid under a modular plan, with all structural members 8 ft on centers. This type of planning, to which Architect Johnson has been turning with such emphasis that all drafting paper in his offices now is laid out to scale in 4-ft squares, makes for a minimum of "conditions," thus reducing much detail work. Virtually all the lumber required is cut to stock sizes in the mill, greatly reducing work on the site.

Johnson credits the modular plan with achieving savings of 15%. He finds it applicable not only to timber but also to steel, as in a $2,659,070 high school at Ketchikan, Alaska, where steel framing and joists are used with similar success, the walls being insulated panels faced with aluminum.

Most spectacular portion of the Lynnwood school is the auditorium-gymnasium section, where 29 arches cover a span of 88 ft. at the base inside and rise to a height of 44 ft. Made by American Fabricators of Seattle, the arches rise almost vertically from the base to a height permitting installation of bleachers with little lost space between the bleachers and the arch. This sharp vertical rise also eliminates need for a buttress, the arches simply being bolted in place on concrete footings with four ¾-in. bolts 21 in. long cast in the concrete. The bolts extend through a 4x8-in. angle iron ½-in. thick on the base of the arch.

The three sections of the arch are bolted together on the site with 22-in. bolts through a ⅜-in. steel plate 5x58-in., then lifted into place by a 20-ton Lorain mobile crane with 60-ft. boom. The arches were placed at the rate of four and five a day, each 7,000-lb. arch requiring 75 to 90 minutes.

Twelve 2x10s glued together formed a 9x19½-in. section in the arches. The laminated roof joists varied from 28 to 50 ft. in length, with sections from 5½x14½-to5½x26-in. The flat roof of the classroom sections and the arched roof of the gymnasium alike were covered with 2x6-in. tongue and groove decking in lengths from 8 to 24 ft.

Concrete was used only in the 3½-in. floor, 8-in. fire walls and 6-in. exterior and corridor walls.

Outlines U.S. housing policy for '54

FHA head sees starts at 900,000—offers no hope for lower down payments on new units

The highlights of the housing outlook for next year—and some of factors that could boost or depress starts:

• New starts in 1954 may run about 900,000—and this could come without the help of easier down payments on FHA-mortgaged houses. That's the estimate of FHA Chief Albert Cole, after his around-the-country tour.

• The cooperative trade-in experiment of the National Association of Home Builders and FHA is off to a slow but satisfactory start: FHA last week broadened its trade-in insurance to cover the entire country.

• The Administration has no intention for the immediate future of lowering FHA down-payment requirements of new houses.

• In its first month of operation, Federal National Mortgage Assn.'s one-for-one plan to ease financing of new houses brought out $90 million of prospective mortgages—indicating a real boom if the money market stays tight through next year.

Wide World photo

ALBERT COLE: He sees smaller—but healthier—house market.

• Housing starts projects—Cole's estimate on the outlook for new housing starts jibes with the latest figuring of other government and private housing officials in Washington.

The economy could still absorb a million new homes in 1954, Cole says, but builders would have to shift their production into market segments not now fully served before they could sell that many units. Some builders are seeking ways to tap those market possibilities now. But in Cole's judgment the bulk of the home builders won't reorient their operations quickly to take care of the people that need housing most. There are too many obstacles in the way, not the least of them being the financial hurdle.

Tight money is already constricting builders' plans. Executive Director John M. Dickerman of the NAHB has advised his 26,000 members not to start any projects "for which they do not have firm (preferably written) financial commitments." Federal housing officials like Commissioner Guy Hollyday of FHA praise that statement as good advice—the kind that home builders should be getting from their own people, not from the government.

But money tightness is not rushing builders into using the recent NAHB-FHA house trade-in gimmick to ease the sale of new homes. A one-month test of the trade-in program in six cities saw only a few applications made to FHA. So long as most builders can sell new houses without resorting to FHA aid on trade-ins, they aren't going to take the time to learn the possibilities of the trade-in program.

• Expend one-for-one—Last week FHA mailed instructions to all of its 74 insuring offices in order to give builders nation-wide the same advantages previously offered the six test cities (ENR July 30, p. 19). All FHA offices now have the details of the "dual commitment" feature that enables a builder to finance improvement of a property taken in trade.

This idea is the heart of the new plan. The home builders and FHA aim to do more than utilize trade-ins to facilitate new house sales; they also want to modernize and improve the old houses turned in as equity on new home purchases. The so-called dual commitment protects the builder in this venture. It binds FHA to insure a mortgage loan on the improved property, even if the builder cannot find a buyer and has to keep the renovated house himself. With this commitment in hand, the builder can borrow the money from a bank to finance the improvements; his own money is not tied up in the operation.

There are limits, of course, to the FHA insurance. For example, the total insured mortgage may not exceed $10,400, and the builder must plow back into the cost of renovation any down-payment cash he receives from the trade-in buyer of the new home.

• Help for trade-ins?—Nobody knows whether these regulations will hamper the spread of the new trade-in device. The mortgage limitations on old houses—improved or unimproved—stem directly from present law. Increases in the loan-value ratio for FHA-insured mortgages on existing houses were discussed with Congress this spring, but the proposals were sidetracked. Should the limitations prove a handicap to the upgrading of old houses under the trade-in program, that fact would be an added argument for raising the loan ratios at the next session.

Trade-ins, of course, are an old story to real estate brokers and to builders. FHA has always done a big business in insuring loans on existing houses. Since 1934, 40% of its insured mortgages have been on such properties, and the proportion has gone up this year: 50% of all new FHA-insured loans since Jan. 1 have gone into the financing of existing houses.

FHA records don't show it, but much of this lending on new houses undoubtedly stemmed from property transferred involving the purchase of new homes. But this kind of FHA financing—like the more common mortgage lending on existing properties—offered no incentive for improvement of the older houses. The new one-package deal supplies such an incentive by giving the builder a chance to make a second profit on the sale of an improved trade-in house—and protection against tying up his own capital in the bargain.

Home builders and the FHA agree that promotion of the new gimmick must come from NAHB and its local chapters. The home builders talked up the plan originally, and the FHA went along to give it a trial. That's part of Hollyday's policy; he believes that the industry should cook up its own self-help ideas and that FHA should cooperate up to limits of law and government policy.

OK $17-million work on Green River locks

With authorization now in hand, the Ohio River Division of the Corps of Engineers will begin work immediately on planning new locks to replace Lock No. 1 and 2 on the Green River in western Kentucky.

The planning stage on the Ohio River tributary will be the first step in a proposed $17-million modernization program for the Green River, 100 mi below Louisville, to permit development of the valuable coal lands along the stream. Existing developments on the river are too small to handle modern tows.

Colombia clamps down on construction

U. S. contractors involved as new government finds construction funds depleted

President Gustavo Rojas of Colombia, who assumed office after a bloodless coup d'etat in June of this year, has shut down severely on rail and highway construction programs involving various American construction companies.

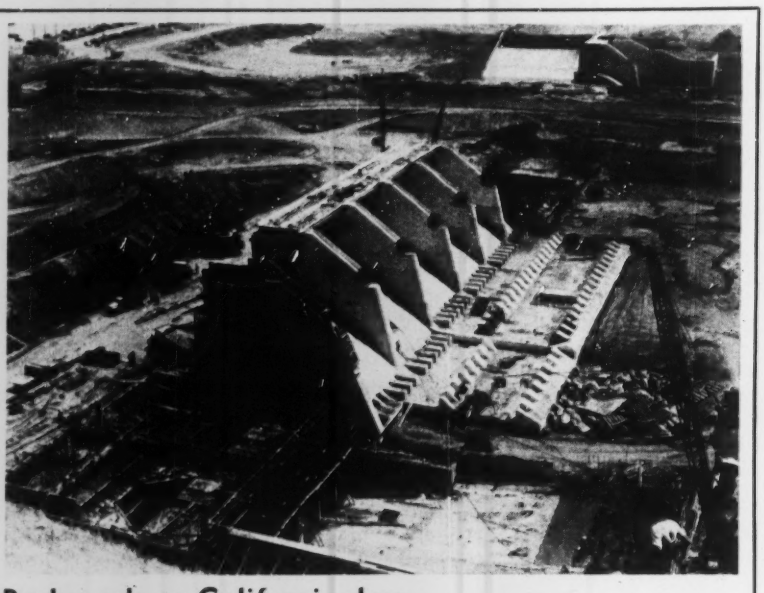
The trouble started when General Rojas found that the Ministry of Public Works under the old government had spent all of its $68-million, 1953 budget and then spent another $9 million on credit.

When Rojas found that it would take another $26 million this year to finish, or carry out works already started, he appointed the National Congress of Civil Engineers to study the situation and make recommendations to the government.

For the Magdalena Railroad—on which Winston, Inc., a subsidiary of Winston Bros. of Minneapolis, has the construction contract—the Congress of Engineers recommended that all work be suspended until a definite survey could be made. The congress, however, did recommend that work should continue on various short lines in order to link up rail nets around the country.

On highway work, the congress recommended that the government immediately create a board of highway experts to oversee all plans and work, and then that the government liquidate all contracts for road construction held by foreign companies. These companies all happen to be U. S. firms: Raymond Concrete Pile, Morrison-Knudsen, Utah Construction Company, Winston Inc. and Construcciones Moore, Ltd., whose parent company is Nathan A. Moore Co. of Los Angeles.

The congress thought that the highway plan was failing for a number of reasons. First, there were no adequate plans, specifications, and budgets for the jobs to be done; second, foreign personnel received excessively high fees, and administrative costs were far too high; third, the foreign engineers lacked knowledge of the country and of the use of typical methods adequate to Colombia's needs. A fourth point: frequently foreigners without adequate preparation for their jobs were employed by the contractors.



Push work on California dam

Nimbus dam progresses toward its late 1954 completion deadline as the discharge apron for the power plant tailrace is laid (foreground). The dam, 15 mi east of Sacramento, Calif., on the American River, will serve as an afterbay for regulation of water released from Folsom Dam, 7 mi upstream. Structure of the 13,500-kw power plant will be a concrete building 85x120 ft, with half of its 85-ft depth underground. The concrete dam will be 46 ft in height above the stream bed, with the upper 24 ft consisting of 18 steel radial gates. Winston-Johnson Co., Monrovia, Calif., is constructing the dam and power plant under a $6-million contract awarded by the Bureau of Reclamation.

Business moves

American Marietta goes further into concrete pipe field; Crane Co. sets plans for titanium plant

Two moves in the business community this week had major import for the construction industry:

(1). American Marietta Co. of Chicago made its third expansion step of the year into the precast concrete field by acquiring controlling interest in the Universal Concrete Pipe Co. of Columbus, Ohio.

(2). The Crane Co. of Chicago announced it has chosen Chattanooga, Tenn., as the site for its proposed $25-million titanium plant.

• **Pipe development**—Universal—manufacturers of concrete pipe and other products—became a subsidiary of American Marietta through an arrangement extending payment over a period of years.

The present active management of Universal will be maintained, with H. S. Eschenbrenner—Universal's founder—in a consulting capacity.

American Marietta, with its 32 pipe manufacturing plants acquired this year, now claims to be the largest producer of concrete sewer and drain pipe in the United States. It acquired 26 plants when it bought Universal; three plants in Michigan when it purchased Lamar Pipe & Tile Co. last May; and three plants in Pennsylvania when it bought the Concrete Products Co. of America, in July.

• **Titanium**—Crane—big manufacturer of plumbing equipment—ended a two-city fight (between Nashville and Chattanooga) when it settled on Chattanooga for its titanium plant.

H. H. Bunchman, Crane vice-president, said the site was chosen because of considerations of location and working conditions. The property chosen comprises about 200 acres, located between N. Hawthorne Street, South Chickamauga Creek and a spur line of the Southern Railway. It is two miles downstream from TVA's Chickamauga Dam. The plant will include some 24 large building units with about 500,000 sq ft of floor space. Vitro Corp. of America has the construction management contract. Camet, Inc., a Crane subsidiary will own the plant.

Hydraulic specialists cite practical uses of science for everyday construction

Minneapolis meeting of international research group finds many applications to problems of engineers, builders

A. J. Fox, Jr.
Associate Editor

Some 300 sweltering hydraulics specialists representing a score of free-world nations convened in Minneapolis last week for the fifth meeting of the International Association of Hydraulic Research. They met jointly this time with the Hydraulics Division of the American Society of Civil Engineers.

Forty-nine papers on basic and applied research (30 from outside the U. S.) had been received and published beforehand, so the timed ten-minute talks allowed to authors were mere synopses, intended to stimulate discussion.

The complete 570-page proceedings of this international convention is recommended as must reading only to specialists in hydraulics. But for others —who will dig it out—there is information of value—some of immediate practical value. Copies of the proceedings will be made available through the St. Anthony Falls Hydraulic Laboratory, in Minneapolis.

• **For bridge engineers**—Hydraulic researchers are bearish on the value of flexible mats formerly thought capable of reducing scour around bridge foundations (ENR May 25, 1950, p. 43) and see grade material in the form of a reverse filter as best protection. Erosion is not the result of turbulence alone, but also of pressure gradients induced by dynamic pressures of flow; upward flow of water through bed material results, and the reverse filter structure will keep material stable, according to C. J. Posey, University of Iowa.

Also of interest, E. M. Lorsen and Arthur Toch of Iowa reported experiments under way to determine relative influence of pier geometry, site geometry, sediment, and stream flow on scour patterns.

• **For canal builders**—The whole concept of sediment transportation was explored by E. W. Lane and E. J. Carlson of the U. S. Bureau of Reclamation who pointed out it takes less force to move material on sloping canal sides than on the level bed; they have plotted the relationship. A. Nizery and G. Braudeau, of Electricite de France, point out a range of partial transportation in which only a fraction of the bed material (particles about ½ the average size) is in motion.

• **For dam builders**—A very practical application of sediment transportation principles was described by Lorenz G. Straub, who as current IAHR president and director of St. Anthony Falls Hydraulic Laboratory, was host to the conference. He described the recent "friction control" closing of the Missouri River at Ft. Randall Dam and indicated that studies of the basic theory, backed by model studies, proved without doubt that the previously untried dredged-fill method would work.

• **For dredging contractors**—Pierre Danel, director of the famed Neyrpic Laboratory at Grenoble, France, discussed investigation of transportation of dredged material through pipe—as well as coal and other slurries. His researchers have spotted influence of pipe diameter, velocity, size and specific gravity of material. Most favorable velocity (and therefore head loss values) can be figured with sufficient accuracy for industrial application.

Wide World photo

DIRECTS KOREAN RECONSTRUCTION—C. Tyler Wood, deputy foreign aid chief, has been named to direct the $1-billion U. S. relief and reconstruction program for Korea (ENR Aug. 13, p. 19). Included in the program are four years of construction on roads, homes, and industrial facilities.

• **For sanitary engineers**—A paper by Henry Stommel of Wood's Hole Oceanographic Institute, Mass., points out that a motionless, or at least sluggish, wedge of salt water is possible in an estuary, while the other extreme is intense mixing. Dispersal of sewerage will depend on which state exists.

Albert Fry and others of TVA report the effects of density currents on pollution, temperatures, and therefore use of TVA lakes. C. S. Howard, of USGS, stated in his paper that 65% of the 1,400,000 acre-ft of silt behind Hoover Dam has been transported by density currents until now there is a 100-ft depth right behind the dam.

• **For hydraulic designers**—Air entrained by flowing water—on spillways, in chutes or wherever—decreases frictional resistance to flow. Also, more loss of energy may take place in a channel due to hydraulic jump, according to Yugoslavia's V. Jevdjevich. Air entrainment was also reported to have reduced cavitation on the face of Grand Coulee Dam, though it is not known how much.

On the minus side, entrained air as a potential problem was discussed in a paper by L. M. Laushey and F. T. Mavis of Carnegie Tech, who are concerned with drop inlets for Pittsburgh's planned deep-rock tunnel sewers. G. Marquenet of the National Hydraulic Laboratory, France, reported a siphon with vacuum to minimize air entrainment in vertical shafts.

• **For irrigation engineers**—Costs of $300 to $400 per mile per year for removing sediment from irrigation canals are not uncommon in the U. S. Means of keeping it out in the first place were covered in a paper by H. M. Martin and E. J. Carolson, USBR.

• **For navigation specialists**—Scour around spur dikes jutting into streams, design of rockfill breakwaters, structures designed for reflective action on waves, and density current effect on channelization all went into the proceedings.

• **For beachcombers**—The same waves that wash away your beach have the energy to bring it back. Structure can determine whether sand comes or goes. A vertical seawall built where waves can reach it will, according to England's Sir Claude Inglis, reflect energy formerly dumped on the beach and cause the beach to wash down to wave height above low water.

More road plans

Study highway plans for San Diego, Kentucky—interchange for Buffalo

The sizzling heat wave that smothered most of the eastern U. S. last week kept highway planners—as well as ordinary citizens—at a steady boil. In area after area, new programs—or new versions of old ones—came off the stove.

In Frankfort, Ky., for example, a citizen's group got together to draft a proposal for a new $160-million primary road system for the state. Headed by Jim Ewing, president of the Kentucky Good Roads Federation, the group heard attorneys express the opinion that state financing of such a program through issuance of bonds (secured by highway revenues) is constitutional.

In Minnesota, the state hired two research organizations to conduct a $105,000 highway study program to determine use, needs and costs of city and rural streets and highways. This will be conducted by the Automotive Safety Foundation of Washington, to make a 14-month investigation of needs, management and road classification; and the Public Administration Service will follow up with a fiscal study.

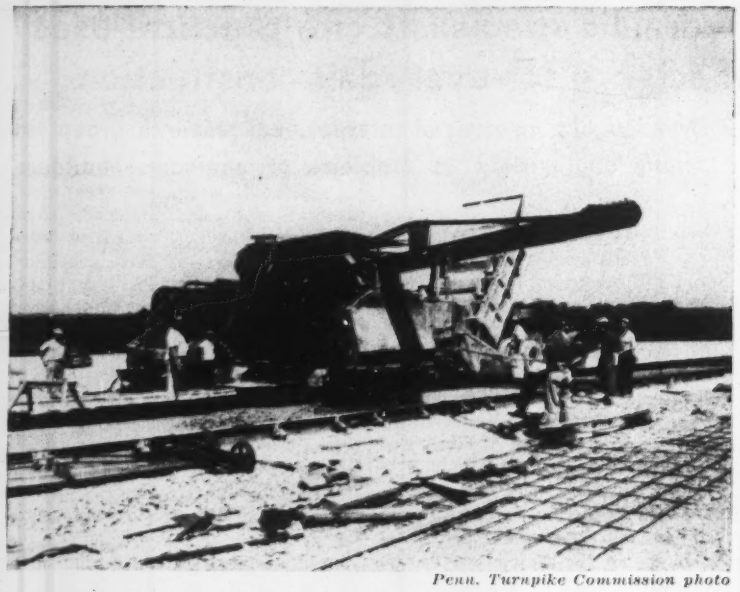
And San Diego County, Calif., called for bids and proposals from engineering firms for an economic study of a proposed low-level highway between San Diego and the Imperial Valley. Proposals are to be submitted by Oct. 15.

• **Other plans**—And there was many another plan simmering on the back burner. New York State, for instance, had completed drawings for what it called one of its most "futuristic" traffic exchanges—a half-mile arc in downtown Rochester, at the end of the Troup-Howell Street Bridge over the Genessee River. A six-to-eight-lane section will be in an open cut to cross under heavily traveled streets, and another six-to-eight-lane section would feed into the bridge.

New Jersey planned to start this fall on a program that will subject some 15,000 drivers of heavy trucks to complete mental, physical and driving skill tests.

Massachusetts' State Board of Public Works Commissioners gave its tentative approval to the route of a projected $200-million cross-state toll superhighway that would have its eastern terminus in Weston.

Arkansas announced an $8.1-million schedule of additions to its state highway construction program, to be undertaken between now and June 30, 1954.



Penn. Turnpike Commission photo

TURNPIKE CONNECTION STARTS—Workmen of George M. Brewster & Son, Bogota, N. J., start first paving operations on a 33-mile extension of the Pennsylvania Turnpike. The extension will carry the super-road from its present eastern terminus near Valley Forge, Pa., to the Delaware River near Edgley, where a bridge is planned to connect with the New Jersey Turnpike. The $65-million extension job is scheduled for completion late in 1954.

Highway departments begin use of red stop signs

Although use of red as the background for stop signs has not been formally approved by the American Association of State Highway Officials, at least three states—California, South Dakota and Florida—have begun supplanting the old yellow signs with red ones.

At its June meeting, the Joint Committee on Traffic Control Devices of the AASHO, the Institute of Traffic Engineers and the National Conference on Street and Highway Safety recommended that stop signs have a red background with white letters, and that the letters be reflectorized. The background also may be reflectorized. Favorable action on this recommendation by the AASHO is expected in November.

California was the first state to change from yellow to red. It uses reflectorized material only for the white letters. South Dakota followed, using reflectorizing materials for both red and white. Now Florida has taken the same step. At some more hazardous crossings South Dakota uses two signs, one four feet in diameter.

Florida made the change after comparative tests, using first its standard yellow stop signs and then red signs with white letters on which the entire surface was covered with "Scotchlite" reflective sheeting.

Concerning the tests, M. A. Connor, engineer of planning, says: "ordinary observance (full stop) by motorists was about 20% with yellow signs. With red stop signs it increased to almost 60%." As a result, the change from red to yellow is to be made as fast as signs are brought in for repainting.

Florida may try using a 3½-ft sign at some of its major intersections, it has been reported.

News briefs . . .

• **Bridge bids**—Bids for construction of sub and superstructure of the planned Columbia River toll bridge between Washington and Oregon (at Umatilla, Ore.) showed American Bridge low at $2,186,913 for superstructure; Cascade Contractors Inc. and Austin Const. Co., Seattle, low on substructure at $676,307. Tudor Engineering Co., San Francisco estimated that the total cost of the structure would be $3.7 million.

• **Take it around**—First of a series of "around the city" stream diversion projects designed to control floods in Montana was awarded to Thayn Construction Co., Salt Lake City, for $787,893. Project—designed to protect Havre, Mont., by diverting Scott Coulee (which flooded the city last year)—includes an earthfill dam and a diversion channel.

Gas company drops underground storage plan

Because anticipated savings in operating costs would be little greater than construction costs, the Nashville Gas Co., said last week it was abandoning plans for the building of a $3-million underground storage "bottle" for natural gas.

T. Cecil Wray, chief engineer, said the company had planned to sink a vertical shaft of 10-ft dia. and 1,000 ft deep. At the foot of the shaft, workers would have tunneled out a bottle-shaped cave, 30 ft high and 30 ft wide at the mouth, and nearly a mile long. By storing gas under pressure, the company hoped to save money by drawing on the stored gas to meet peak demands, rather than on pipeline suppliers.

Canadian pump-storage adds power for Alberta

Scheduled for completion this year is a scheme of the Calgary Power Ltd. to pump water up a mountain so it will run down again to produce additional power.

The project, supplementing the $13-million Spray development 60 mi west of Calgary in Alberta, will cost an additional $450,000. Calgary Power engineers expect the project to be completed this fall.

The project will include taking waters from Goat Creek, below the Goat Valley diversion dike, with two separate pumping stations and raising the waters up over the mountain and letting it fall into the Goat Valley canal which carries water to the North Whitman's Dam. From there it falls through tunnels to the Spray power plant and to the Rundle plant farther down.

The pumping stations will recover water that would otherwise escape down Goat Creek. The water is partly from natural drainage not caught in the Spray reservoir, upstream from the Goat Valley dike, and partly from leakage in the Goat Dike.

The water recovery project, when it is completed, will result in an additional production of 80,000,000 kw hours per year.

The reservoir storage water will be used throughout the winter season so that the recovery of sufficient water to produce the additional power is very worthwhile, saving the necessity of purchasing or producing that much additional steam power.

The water from the Spray project eventually passes through three other hydro stations on the Box River downstream. A fourth plant that will use the water is under construction at the present time.

LABOR

Uneasy calm

Three-project cluster has ominous strike-free week

For the first time in many weeks there were several consecutive days of labor peace in the Paducah, Ky., area. But the calm was uneasy, and there seemed little doubt more trouble was in the making.

Here's how conditions stood at press time:

• At Paducah, carpenters have withdrawn their picket line in the dispute over wages with five subcontractors of F. H. McGraw & Co., prime builder of the Atomic Energy Commission's $1-billion factory. The carpenters, who want the lump-sum subs to match wages paid by McGraw (ENR Sept. 3, p. 28) are working under a truce which will expire Sept. 15. There is little doubt that the plant will be closed if the subs fail to grant pay increases.

• At Joppa, Ill., just across the Ohio River from Paducah, work is being resumed on a modest scale by Bechtel Corp., new contractor for a privately developed power plant being built to supply the Paducah project. Supervisory personnel account for most of the rehiring so far, but craftsmen are starting to appear on the job, closed down (ENR. Aug. 13, p. 21) when Ebasco Services, Inc., lost its contract. There are rumors of impending labor disputes, but so far labor at Joppa appears to want peace.

• At Shawnee, Ky., some 200 ironworkers have gone back to work on a power plant being built by the Tennesee Valley Authority to supply power for the AEC's Paducah project. The ironworkers, who walked off the job in a huff three weeks ago over a minor issue, technically had resigned. Last week they were rehired as the result of arbitrators' decision to call them back without penalty.

Duluth firm seeks damages from AFL carpenters union

A $153,000 damage suit against AFL Carpenters Union of Duluth, Minn., has been filed in St. Louis County district court by W. C. Smith, Inc. The legal action results from work stoppage because of a dispute between two unions.

The firm alleges that while it was building low-rent public housing for Duluth in 1951, carpenters walked off the job when shingling and siding work was turned over to the AFL roofers union.

Both labor groups claimed jurisdiction over the work. But a ruling by the National Joint Board for Settlement of Jurisdictional Disputes in the building trades industry ruled for the roofers. The carpenters were ordered back to work.

Union circles claim there was no strike call and no picketing, but merely a decision by members of the carpenters union to "walk off the job." To collect damages, the firm will have to prove that the Duluth carpenters union called the work stoppage.

The lawsuit is the first of its kind in Minnesota under a section of the Taft-Hartley law which permits court action for breach of contract and damage when a union and employees act to force a company to assign work from one labor organization to another.

N. Y. truckers back, gainless after nine-week strike

Building materials began to flow again in New York City last week as truck drivers of Local 282, International Brotherhood of Teamsters, went back to work after membership approval of an agreement to arbitrate all issues in the two-month strike (ENR Sep. 3, p. 27).

Agreement was reached last Tuesday, when the strikers found themselves in a three-way squeeze by public opinion, adamant employers and an ultimatum that came from Dave Beck, international chief of the teamsters.

With the probable alternative of having their local charter taken away from them, the drivers, who had dissipated most of their strength in a fight to overthrow local leadership, agreed to go back to work under their pre-Korean contract, pending arbitration.

The strike has been costly for New York City and environs as well as for the drivers.

The best two months of the building season have been lost. And nearly 200,000 construction workers have lost from three to eight weeks' pay.

Turnpike tie-up ends

A two-day walkout ended last week on 10 miles of the Ohio Turnpike throughout Mahoning County when laborers returned to work on two sections being built by D. W. Winkleman Construction Co. of Syracuse, N. Y.

Before you buy:

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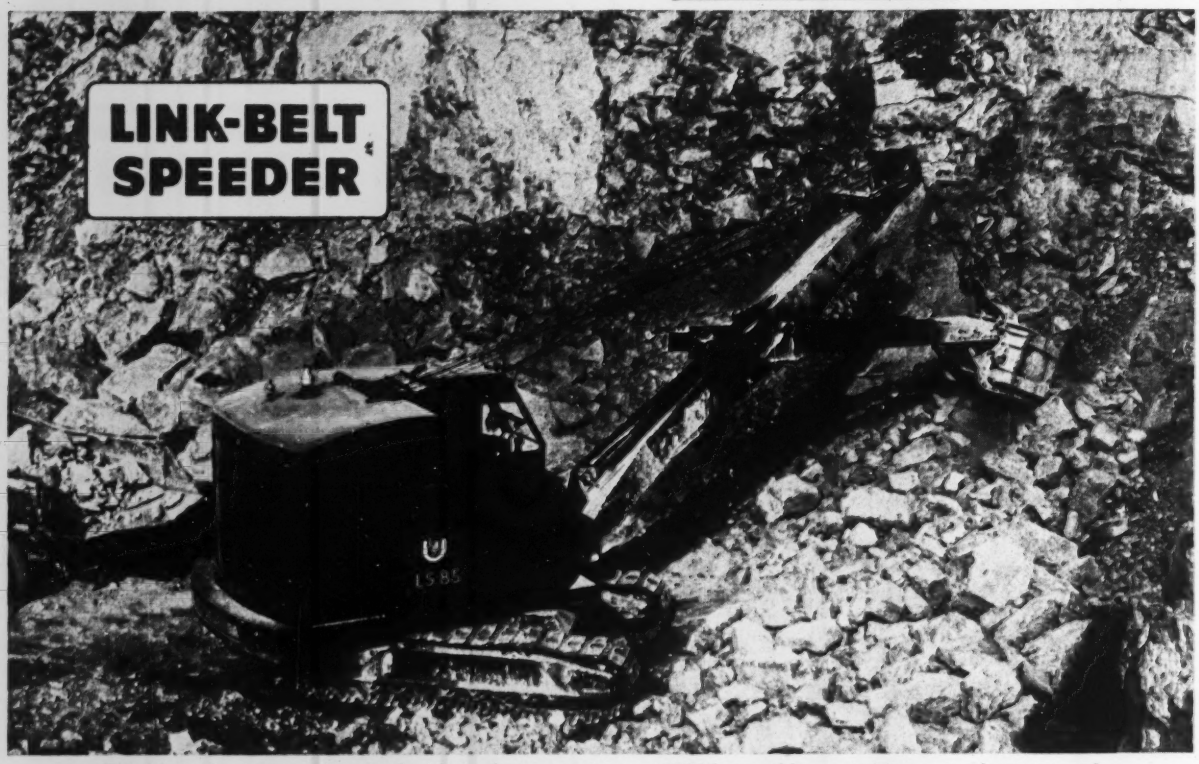
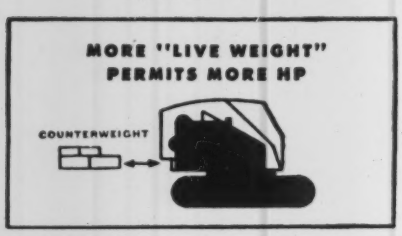


This LS-85, despite tough, big-chunk rock, has been operating over 1200 hours without requiring one replacement part!

Don't judge available power by engine model only ... NET hp is what adds up to extra profit!



COMPARE shovel-cranes with and without counterweight. That test spotlights the size, weight and heft built into the working parts and structural members. You'll find the LS-85 has more "live weight" than comparable ¾-yard shovel-cranes.

Greater net horsepower assures faster, deeper digging. Bigger loads are handled without stalling. For example: the diesel driven heavy-duty ¾-yard LS-85 packs 92 net hp. That's more power than comparably-sized competitive rigs can safely use. It's why the LS-85 has more digging force behind its bucket teeth . . . why it cuts so smoothly . . . hoists and swings without a pause.

Use of greater net hp is practical because of all-welded, stress-relieved construction *and extra "live weight."* This *extra live weight* is in heavier, sturdier working parts and structural members—rather than a heavier counterweight. All this means year-after-year service and low maintenance costs. So whatever you do, don't compare power by the engine model only—CHECK *NET* HP.

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Building labor keeps lead in pay raises

Construction workers did well from the standpoint of wage increases—in comparison with workers of other industries—since the end of World War II. However, their raises during the first nine months of this year were somewhat lower than for 1952. In this respect construction labor followed a trend, described by U. S. NEWS & WORLD REPORT, of several other major industries.

Traditionally more highly paid because of the once seasonal nature of their work, construction men have continued to gain in wages accordingly, even though most of them no longer face the necessity of earning enough in summer to see them through winter months.

	1953 Raise	1952 Raise	Total Raises Since 1945
Steel	8.5¢	16¢	87¢
Autos	5.0¢	8¢	81¢
Electrical equipment	7.0¢	9¢	82¢
Oil rening	9.0¢	15¢	$1.10
Men's clothing	12.5¢	no raise	65¢
Copper mining	9.0¢	8¢	85.5¢
Textile mills (northern)	3.0¢ (cut)	3.5¢ (cut)	57¢
CONSTRUCTION*			
Common labor	10.4¢	16.3¢	97¢
Skilled labor	13.3¢	18.2¢	$1.37
Bricklayers	9.1¢	19.1¢	$1.57
Carpenters	14.4¢	18.5¢	$1.27
Structural iron workers	16.3¢	17.0¢	$1.28

*ENR Business News

NLRB shapes up

Battle lines forming as Eisenhower eyes vacancy

The trend of opinion of the National Labor Relations Board for the next few years may well depend on the outcome of a behind-the-scenes tussle in Washington over the next appointment to the board.

Republicans are urging that Eisenhower's third—and majority making—appointment be L. E. Gooding, chairman of the Wisconsin Employment Relations Board for the last dozen years. He would team up well with Guy Farmer, named a month ago, and Philip Ray Rodgers, picked last week (ENR Sept. 3 p. 28). Farmer has represented employers before the NLRB, and Rodgers thinks NLRB has ignored both Congress and the courts in applying the Taft-Hartley law.

But Gooding lacks the blessing of Secretary of Labor Martin Durkin. This makes his chances slim, for the White House has been clearing with Durkin all appointments to high posts in labor agencies.

Durkin may have nothing against Gooding, but American Federation of Labor leaders in Wisconsin don't like him. That's enough for Durkin. He has no wish to alienate the Wisconsin AFL any more than he has already by repudiating the attack made on Eisenhower by Durkin's successor as president of the plumbers union, Peter Schoemann a Wisconsin man.

If Eisenhower picks someone who will lean more toward the views of the two holdover members of NLRB—Abe Murdock, former New Deal senator from Utah, and Ivar Peterson, former assistant to Senator Wayne Morse—the expected changes in NLRB thinking will come slower and harder.

The lineup Eisenhower makes now may have to stand for the duration of his Administration, because Peterson's term does not expire until August 1956, and Murdock's not until a year later.

Early reaction mixed to Alabama labor law

The bitterly contested "right to work" labor law—outlawing the closed shop in Alabama—has been signed by Gov. Gordon Persons.

First reaction from union leaders—after pressure in the legislature and later on Gov. Persons lost force—was that organized labor would stage a general protest walkout. But public approval of the law (the measure was favored 4 to 1) put a damper on the idea.

Official feelings over passage of the bill were mixed:

Steven Latham, Alabama State Federation of Labor president: "We're going to live according to the law and abide by it."

Eugene Wells, state CIO secretary-treasurer: "The measure will result in lawsuits and encourage labor organizations to remove from present contracts—when they are renewed—the no-strike pledge. Management will be reluctant to renew present contracts."

Gov. Persons: "Labor unions will be far stronger and members in them will have far greater interest and respect for the organizations when membership is gained without being compulsory."

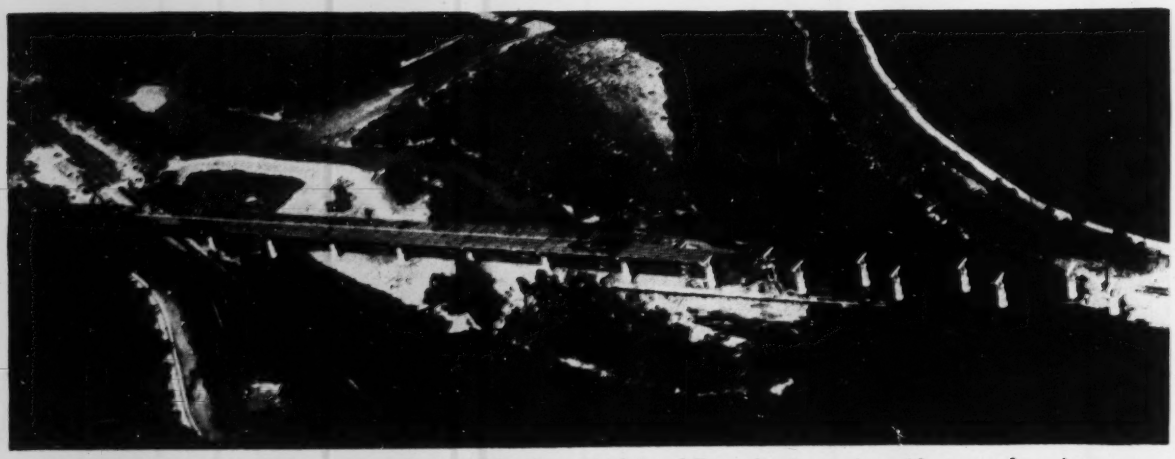
The new Alabama law, modeled after the Virginia measure which has stood up in the U. S. Supreme Court, (1) outlaws the union shop and kindred labor agreements, (2) protects employees from being fired because they do not choose to become union members, (3) outlaws mandatory check off of union dues (ENR Sept. 3, 1953, p. 27).

Labor briefs . . .

• **New labor advisor**—Joseph D. Keenan, secretary-treasurer of the AFL Building and Construction Trades Department, has been appointed assistant to Director Arthur Flemming of the Office of Defense Mobilization. His job: advisor on labor affairs.

• **Oak Ridge walkouts**—Nearly 700 union carpenters have walked off the $464-million atomic plant construction project at Oak Ridge, Tenn. Trouble seems to stem from a jurisdictional dispute: The carpenters objected to electricians' doing some work on scaffolding they were using. Meanwhile in the city itself, AFL painters posted pickets on housing and warehousing painting jobs, idling an estimated 400 maintenance and service workers.

• **Teamsters' troubles**—An AFL truck drivers' strike (140 drivers) against Louisville, Ky., contractors has stopped work on the $175-million, Indiana-Kentucky steam electric generating plant being built for the Atomic Energy Commission. Respect for the union's picket line has idled another 3,500 workers. Teamsters want an immediate wage hike of 18 cents an hour; contractors offer 13 cents now, another 5 cents on March 1.



DUAL BRIDGE crosses the Delaware River between New Jersey (right) and Pennsylvania on piers with staggered spacing.

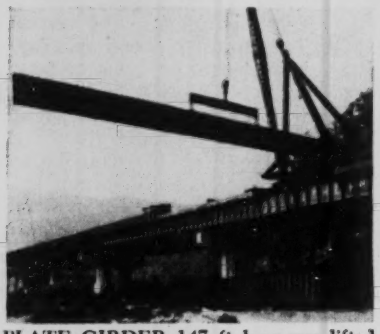


PLATE GIRDER 147 ft long was lifted from a railcar by a derrick and . . .

SEATED ON A MATERIALS CAR, the girder was rolled down the bridge to an 85-ton stiffleg derrick set over a downstream pier.

Staggered piers aid erection

In placing long-span steel plate girders for a 2,400-ft long dual-highway bridge over the Delaware River, Bethlehem Steel Co. took advantage of the arrangement of bridge piers to simplify the job.

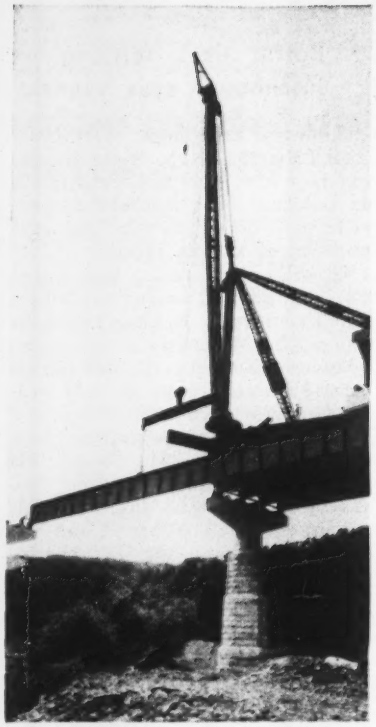
About one mile downstream from the Delaware Water Gap, between New Jersey and Pennsylvania, eastbound and westbound traffic on a four-lane extension of U. S. 46 will cross the river on continguous parallel bridges. These are composed of 13 simple 147-ft spans and a 145.5-190-145.5-ft continuous girder. Because the crossing is on a skew, the downstream structure has an additional 63-ft span at one end. As a result, its reinforced concrete piers are staggered this amount with respect to the piers of the upstream bridge.

A 50-ton crawler crane on the ground placed the continuous girders in the first erection steps. To erect the 147-ft girders, Bethlehem set an 85-ton stiffleg derrick-traveler over a downstream pier on the ends of girders already in place. From this position, the traveler first set two near girders of the four in the upstream span, then the four in the next downstream span. Finally, it placed the far girders of the upstream bridge. Then the traveler was moved on rails bolted to the girders to the next downstream pier to repeat this procedure.

Since the piers are T-shape in elevation, care had to be taken to offset cantilever action when the far girder was swung into place. Bethlehem erected a blocking beam so that the derrick could be blocked up from the upstream girder of the downstream bridge and from the two inside girders of the upstream bridge.

The girders are 7½ ft deep; inner members weigh 31 tons, outer ones, 34 tons. Brought to the site by railroad, they were unloaded with a 35-ton stiffleg derrick on the upstream bridge and set on a materials car that rolled on rails atop the girders for delivery to the 85-ton derrick. Because of the length and flexibility of the girders, it was necessary to handle them with a 30-ft lifting beam. They were staved at both ends and the center before they were freed from the derrick falls and landed on the shoes.

The crossing is being constructed for the Delaware River Joint Toll Bridge Commission.



BIG DERRICK was in a good position to erect upstream girders.

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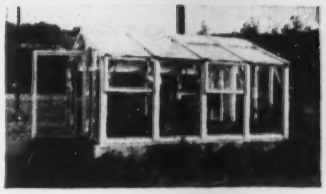
By allowing initiation at the bottom of the holes, the ROCKMASTER Blasting System can keep the explosives force under prolonged confinement . . . as shown in the above photos taken at the height of four different ROCKMASTER blasts. Each photo shows considerable movement of burden with practically no escaping gases.

To see how the ROCKMASTER Blasting System can improve your blasting efficiency and reduce noise at the same time, send for your copy of the booklet featuring the ROCKMASTER Blasting System.



The North Jersey Quarry Company erected this greenhouse at its Millington operation, 400 feet from the working face, to prove that its blasts don't break windows. The reduced noise and vibration of the ROCKMASTER *system helps them improve community relations.*

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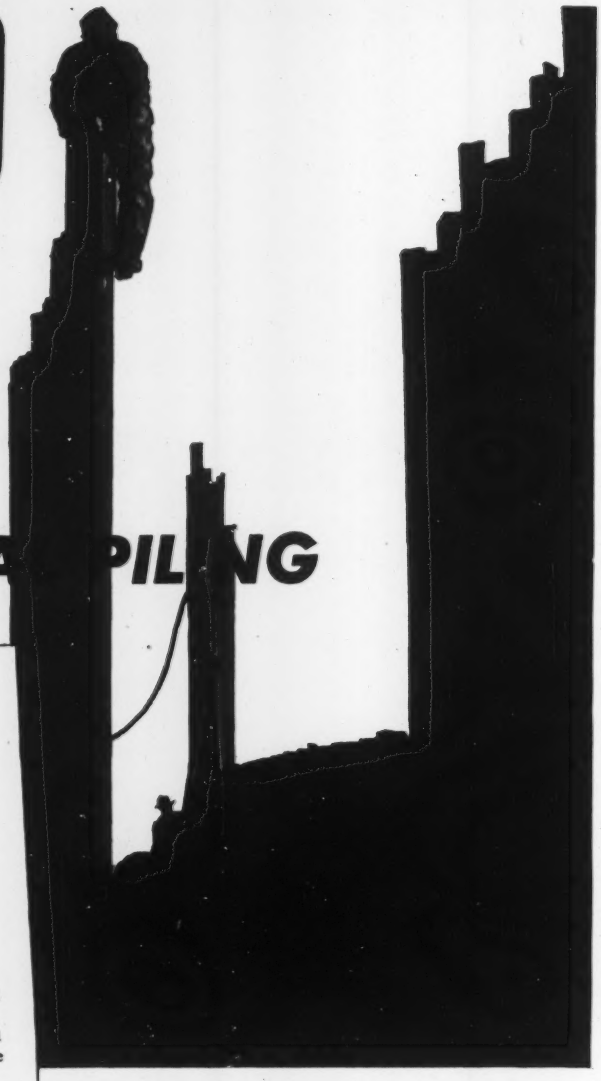

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Arthur J. Hendrickson

Arthur J. Hendrickson,
President.

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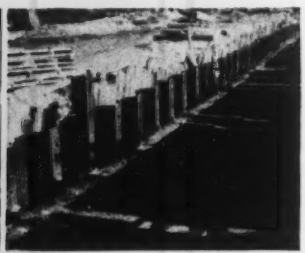
66-inch diameter precast conduit at an average depth of 35 ft.—placed atop a 7-inch concrete slab.



Piling holds back mud for The Sanitary Trunk Sewer conduit which ran 7 miles on Long Island's South Shore.

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Ontario Hydro construction:

On-schedule at Niagara

END RUN—Sir Adam Beck No. 2 Generating Station will get its water from a tunnel and canal built on curved location from intake 1¼ miles above Niagara Falls. Effective head will be 295 ft; falls are 165 ft high. Pumped storage is project's newest feature.

While the fight wears on over sponsorship of U. S. hydro construction at Niagara Falls, Canadians can expect electrical energy from their share of new treaty water by mid-1954.

This delivery date is right on the schedule announced by the Hydro Electric Power Commission of Ontario shortly after October, 1950, when a new international agreement on Niagara River diversion for power came into force.

What makes Ontario Hydro's forthright performance still more notable is the fact that project-development stages have been initiated faster than originally foreseen. Placing additional loads on design and construction resources, this speed-up is pressured by the region's phenomenal economic growth.

First-stage development was detailed in ENGINEERING NEWS-RECORD two years ago (Sept. 6, 1951, p. 39). It included six 75,000-kw units in Sir Adam Beck No. 2 Generating Station, located in Niagara's gorge six miles downstream from the falls. An intake above the falls, a 5½-mi tunnel of 45-ft inside dia (20,000 cfs), and a 2¼-mi canal (40,000 cfs) to the generating station also were in the first stage.

Stage two, initiated early in 1952, includes six more power units and a second tunnel. This was as far as originally-announced plans went. However, in April, 1953, Ontario Hydro announced a pumped-storage project that will increase the peak-demand-time-capacity of Sir Adam Beck No. 2. This project includes a reservoir, a pump-generating station and enlargement of the plant's forebay and headworks, in anticipation of a fourth-stage project, not yet initiated—the addition of four main generating units, for a total of sixteen. Total money now allocated for the work is $321 million.

• **Pumped-storage project**—Terms of the 1950 treaty are partly behind the pumped-storage project. For scenic purposes during the daylight hours of the summer months at least 100,000 cfs must flow over the falls. At other times the minimum is 50,000 cfs. Thus, more water is available at night when power demand is light than in the daytime when demand is heavy. Night power will serve pumps supplying a 15,000-af reservoir alongside the canal. The reservoir will be drawn down during peak daytime demands. Water will return to the canal through the pumps, which will act in reverse as turbines. Generators thus driven will add 175,000 kw to the project's overall output.

• **Time schedule**—Commercial power from the first two units at Sir Adam Beck No. 2 is expected to be available during the late spring or early summer of 1954; all twelve units will be delivering in 1956. Tunnel No. 1 will be ready for water next March and Tunnel No. 2 should be ready nine months later.

Built from five shafts located at the centers of 250-ft cross-cuts between their centerlines, the parallel tunnels have been driven in a total of 20 headings. Driving rates running up to 250 ft weekly in a heading made the holing through a more or less regular occurrence since last October. The last one is taking place this month. The first heading was turned in January, 1952. Concreting now is well advanced in Tunnel No. 1, with completion expected this December.

The tunnels are the only major features of the project that are being done by contract, the intake, canal and power station being built by Ontario Hydro forces. Contractor for the two downstream sections and for the section nearest the intake is a joint venture, principally of U. S. firms, headed by B. Perini Sons, Inc., Framingham, Mass., and Walsh Const. Co., Davenport, Iowa. Rayner-Atlas, a Canadian joint venture, has the two intervening sections.

• **Field construction**—The tunnels, characterized either as the "biggest long tunnels" or the "longest big tunnels" in the world, are the project's most significant features from a construction standpoint, so techniques used on them will be recounted first. But there also is useful information in the central-mix concrete setup (Ontario Hydro supplies concrete to tunnels as well as to its own jobs) and at the intake and power plant.

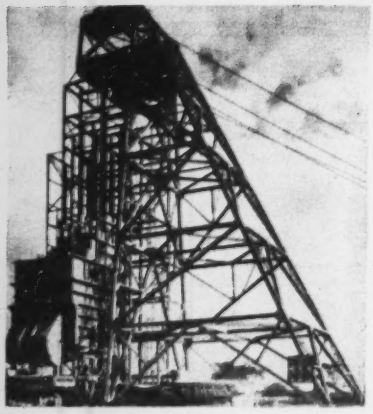
• **Top-drift driving**—Excavated diameter of the tunnels is 51 ft. Except for

some modified full-face driving early in the Rayner-Atlas contract, the approach in all headings is to drive a top drift, down to 2 ft below the springline, then drill and blast the bench after the top heading is holed through. This description covers the Perini operation, from which the Rayner-Atlas procedure varies only a little.

Key to fast driving is a shaft and hoisting arrangement capable of handling big equipment, heavy steel sections and tremendous quantities of muck. Each headframe, 120 ft high, is of an unusual design that keeps hoisting loads away from the shaft collar. Sheaves are supported by a frame that cantilevers out from a broad A-frame with its four foundation pads well away from the shaft. A lighter structure atop the shaft carries the skip, cab and counterweight guides. Shafts 26 ft dia contain a balanced pair of 14-yd muck skips and a 9x22-ft cab 12 ft high—capable of carrying a 13-yd end-dump truck. Hoisting power comes from two electric hoists with 8-ft drums and 2⅛-in. cable. Skip power is 450 hp; cab power, 300 hp. Hoisting speed is 350-400 ft per min.

• **Drilling jumbo**—A three-deck drill carriage rides on a 28-ft gage track. Top deck is solid; lower decks have drop-aprons in their centers to allow passage of mucking and hauling equipment. Forward, the jumbo mounts 17 drifters with 10-ft feed, on jibs with hydraulically-powered lift and swing.

Use of carbide-insert bits makes it possible to take advantage of the long drifter feed without intervening drill-change. The average top-drift round is 144 holes, with a horizontal V center cut, pulling about 17 ft. Most holes are 19 ft (one drill change), but rim holes are deeper, to eliminate a tendency of the face to become concave. Powder consumption has been about 2.65 lb per cu yd of solid rock excavated.



HEADFRAME for high-capacity hoisting cantilevers sheaves over shaft so extra weight won't be placed on shaft lining. (Tunnel photos show Perini-Walsh work.)

All muck hauling is diesel-powered, scrubbers being required to minimize the nuisance and dangers of fumes from 13-yd trucks. There also are two small bulldozers and a 1-yd rocker shovel, for muck clean-up. Main mucking machine is an electrified shovel with a short stick and 3½-yd bucket.

Ground support, required above the springline, consists of steel arch-rib sets with metal lagging. These are installed from the jumbo's top deck during drilling—a time-saver. A round is drilled, blasted, mucked and timbered in about 10½ hours. The job works three 8-hour shifts six days a week.

• **Bench cut**—Downhole drilling from an unusual suspended carriage accomplishes the bench cut. Drifter feeds are mounted on a pipe bar at one edge of the carriage, transversely to the tunnel centerline. At each end of the platform are fixed rails that engage track rolls suspended from the rib steel overhead.

The jumbo carries 13 drifters—the number of holes in a single transverse line. Each one drills to a depth calculated to define the circular invert cross-section line. When a row of holes is complete the carriage is moved by air-hoist lines to a new row position 3 ft away. Thus the primary drilling pattern is spaced at about 3x4 ft.

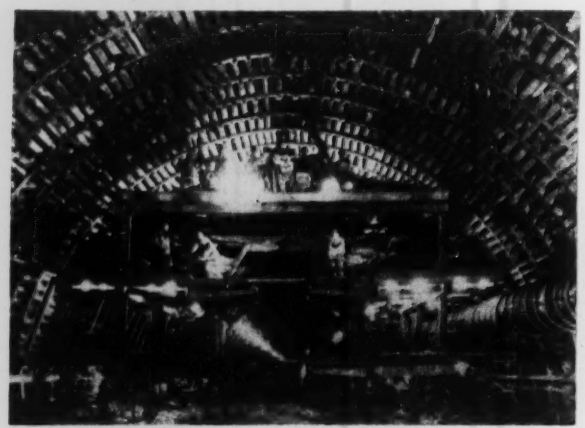
Within each 3x4-ft area defined by 4 holes a secondary hole 8 ft deep is cut (where the middle dots are on the "five" sides of dice.) This hole was found essential in keeping down the size of rock near the top of the muck pile.

Millisecond-delay blasting is used in a V pattern, starting at the center of the face. About 25 rows is the maximum number shot at a time. If more rows are shot, many holes are lost because of relieving of rock pressures. The job is completed by drilling and shooting rim holes from the muck pile. These are about 4 ft deep, spaced 2½ ft along both outer edges of the bench. Mucking procedure is similar to that for the top drift.

• **Concreting**—An average tunnel wall thickness of 3 ft takes 18-20 cu yd of concrete per lin ft of tunnel length—almost a million yards of lining concrete for the two tunnels. Big concreting equipment and ingenious concreting procedures have been developed to handle this assignment.

The probable key to the efficiency of concrete placement at Niagara Falls is the down-hole. Spaced mostly from 580 to 700-ft intervals along the tunnel location, the down-hole is 160 to 300-ft surface-to-tunnel pipe chute 10 in. dia that eliminates a tremendous amount of shaft hoisting (or chuting) and underground hauling.

Accompanying sketches show how



DRILL CARRIAGE for top-drift tunneling mounts 17 drifters on power jibs, rides 28-ft gage track. Middle and lower deck aprons drop to pass mucking equipment.

DRILL CARRIAGE for bench excavation mounts 13 drifters that make a complete transverse row of down-holes at a single setting. Jumbo hangs from arch steel.

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The new Paseo bridge over the Missouri River at Kansas City—the longest of its type in the world—has four river piers, the tallest of which extends to a depth of 104 ft. below normal river level.

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McKiernan-Terry 9-B-3 Double-Acting Pile Hammer driving cofferdam steel sheet piles at one of the sand island and ice breaker sections of the Paseo bridge. Consulting Engineers: Howard, Needles, Tammen & Bergendoff. Contractors: Massman Construction Company and Kansas City Bridge Company

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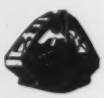

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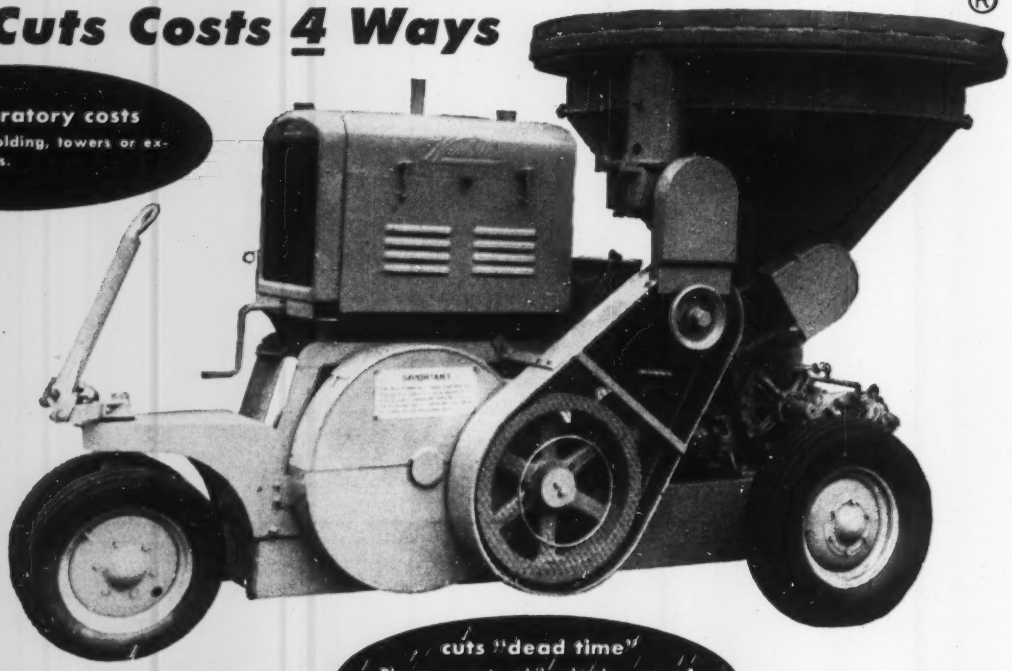

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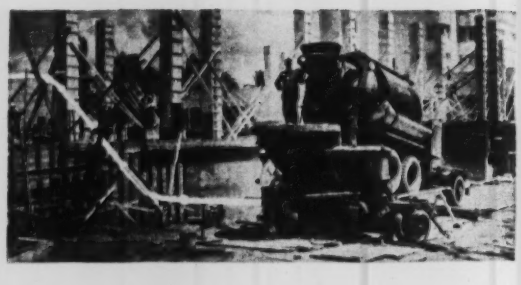

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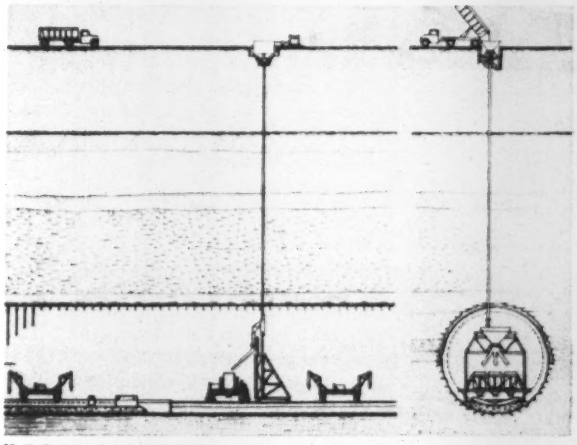
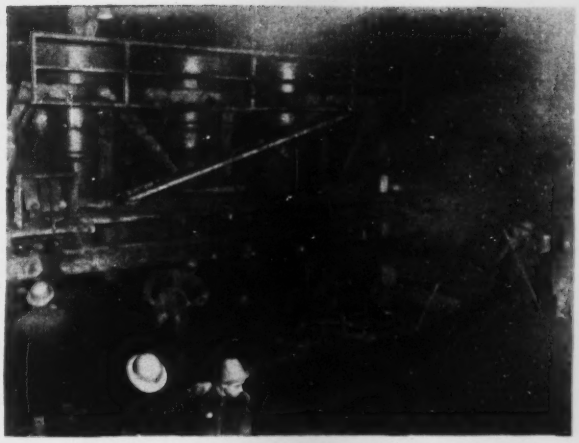
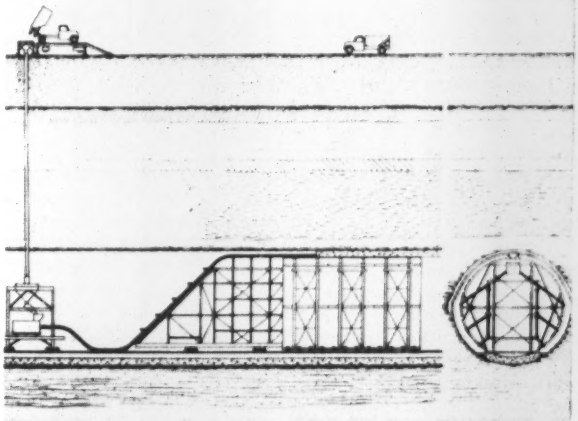
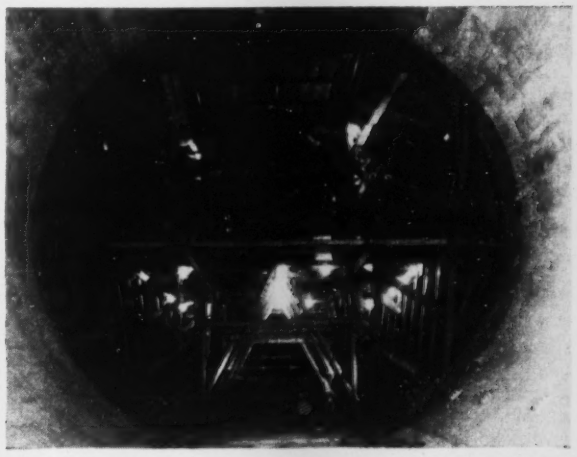




INVERT CONCRETE is dumped through down-hole to hopper, which feeds buckets on shuttle car (sketch). Small cranes handle forms. Concrete is placed ahead of heavy screed (photo). Note trough, left, for concreting top edge of invert section.





ARCH CONCRETE goes from down-hole to three concrete pumps. Pipes climb trestle traveler to top of 70-ft long, slightly collapsible steel arch form (photo). Note chuting arrangement for concreting below springline (heavy lines in cross-section).

the down-hole serves both invert and arch concreting. A truck dumps concrete into a screw-feed hopper that maintains a steady flow into the down-hole.

For invert concreting the down-hole feeds a distributor hopper (rail-mounted for movement to the next down-hole), which chutes concrete to three tanks on a shuttle car. The car transports the concrete to a point in front of a heavy rail-mounted invert screed, dumping through gates in the bottoms of the tanks.

For arch concreting the down-hole feeds a trio of concrete pumps that force the concrete through three 10-in. pipes up an inclined trestle traveler to the top of the arch form. This form is 70 ft long, and it soon will be increased to 80 ft. Collapsible for forward travel on rails after the concrete has set, it contains a system of chutes (heavy black lines on drawing) that lead to doors at three levels up to the springline. The top half is fed directly from the pipes, inside the form. Men with vibrators work inside the form as the concrete rises.

• **Concrete plants**—Concrete comes from two central-mix plants, one near the tunnel outlet and the other near the inlet. Total requirements for the project including pumped storage, are 2,000,000 cu yd, the largest amount ever scheduled for a project in Ontario.

In addition to the tunnel, which will take 955,000 cu yd plus overbreak, the intake will require 113,000 cu yd; trapezoidal canal (where it crosses a prehistoric channel of Niagara River; the remainder is in rock) lining, 49,000 cu yd, forebay and headworks, 68,000 cu yd; and power house, 258,000 cu yd.

Each concrete plant has a normal capacity of 180 cu yd per hour. Four two-yard tilting mixers, served by an automatic weighing-recording batch plant, assure this output. Cement storage capacity at plants is 44,000 bags and 20,000 bags.

Sand is hauled from deposits 80 miles away, being unloaded from hopper cars into a standard track hopper feeding a 30-in. conveyor that stockpiles the sand adjacent to each concrete plant and its coarse aggregate stockpiles.

Coarse aggregates are produced on the job, the upper layer of sedimentary rock in the canal excavation being a suitable source. The crushing plant is at the canal's midpoint. Two (42x48-in.) jaw crushers are coordinated into a single effective unit, with crushers and screens, side by side, serving a single belt conveyor at the output end. Primary jaw crushers are set to 4½ in. Secondary and tertiary crushers, of cone type, cut the material down to 1½ in. and smaller. About 80% of the project's concrete is pumped to place, so only two sizes are used—1½ in. and ¾ in.

A feature of the crushing and screening plant is the installation of spray nozzles over the belts during the various stages, to cut down dust. The aggregate is not actually washed, so

Ontario Hydro photos

CONCRETE PLANT, one of two on project, has four two-yard tilting mixers, which yield 180 cu yd per hour. Project requirement is 2,000,000 cu yd.

about 4% dust adheres; this is screened off the stone (now dry) later, just before it enters the mixing plant.

Under the classifying screens are surge bins, from which trucks may be loaded or aggregates may go onto a belt that conveys them to a 1,600-ft long storage pile. This conveyor deposits a series of stockpiles 60 ft high, underneath which a reclaiming tunnel runs. The 30-in. conveyor in this tunnel leads directly to the top of the concrete mixing plant.

Roughly half of the aggregates in the surge bins are trucked to a similar stockpile setup at the upstream concrete plant.

Concrete is moved from the two mixing plants by standard dump trucks, which are loaded by 30-in. belt conveyors leading from wet batch hoppers under the mixers.

• **Intake construction**—One destination of concrete trucks is the intake area, 1¼ miles above the falls on the Canadian shore. Here, behind a wood-cribbed cofferdam that bulges the river's shoreline, is a busy construction site that eventually will be a peaceful park. This park will cover the following elements of each intake structure: A gathering tube 500 ft long, varying from zero cross-section at the upstream end to 45x45 ft square at the lower end (water will enter this tube through a submerged vaned slot 500 ft long in the riverside face of the tube); a 45x45-ft square conduit 143 ft long, leading to a control gate section; the control gate section, also 45x45 ft square, 95 ft long; a transition section, from 45x45 ft square to 45 ft dia (the tunnel portal), 100 ft long. Ontario Hydro engineers say the submerged gathering tubes will eliminate problems of ice-clogging in the winter.

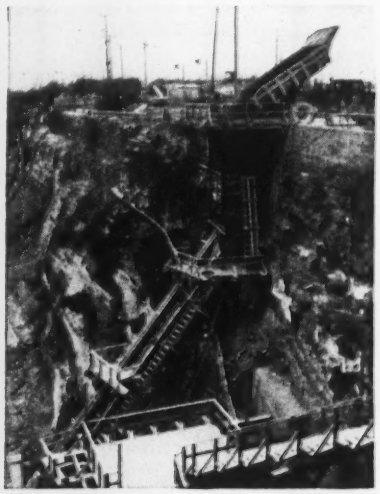
Excavation in the intake section is partly in rock, partly in earth. To obtain satisfactory water-tightness within the excavation it was necessary to ring the area with 25-ft grout holes in rock, spaced to a minimum of 5 ft apart.

Concrete placement in the intake area is conventional, the retaining walls, box sections and roof slabs being accessible by concrete trucks.

• **Chuting at power house**—More spectacular is the concreting at the power house. Here, most of the concrete must be lowered 240 ft from the top of the Niagara gorge. Chuting through 12-in pipes, at 60 deg from the horizontal, has been found workable. The pipe is fabricated so that any 20-ft section can be revolved independently of the rest of the pipe. In operation, each section of pipe is gradually turned so that the wearing will take place evenly for the full inside circumference. With this precaution the pipe is expected to last the whole job.

To prevent segregation in chuting, concrete lands first in a 4-cu yd baffle box, which breaks the momentum of the fall. The concrete then overflows into a wet-batch hopper serving two concrete pumping machines.

• **Management**—In charge of field operations at Niagara for the Hydro Electric Power Commission of Ontario is Gordon Mitchell, field project manager. W. L. Fraser is field project engineer; William Hogg, assistant project engineer; L. J. Gallagher, general construction superintendent; Corry Robbins, Asst. Gen. Supt. For Perini-Walsh, Jesse R. Glaeser is project manager, Alex Simpson is general superintendent, and P. M. Putnam is chief engineer. Rayner-Atlas key men are Hew M. Scott, managing director, Carl Larson, gen. construction supt., and T. A. Lazier, chief engineer.



INTAKE STRUCTURE (right) will be covered by a park and riverside road. No. 1 gathering tube area is in background; control gate section is in foreground. Power house concrete is transported by truck and chuted 240 ft downward from gorge rim through 12-in. pipe to concrete pumps (right). Intake and power house work are being performed by Ontario Hydro forces.

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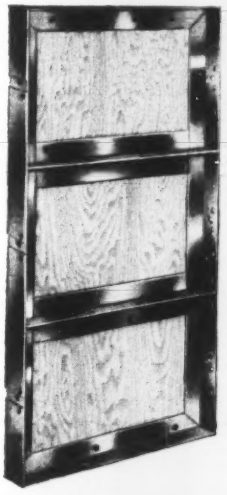

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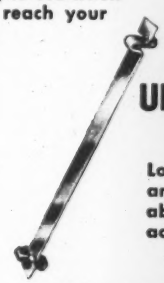

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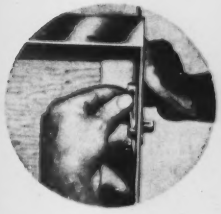

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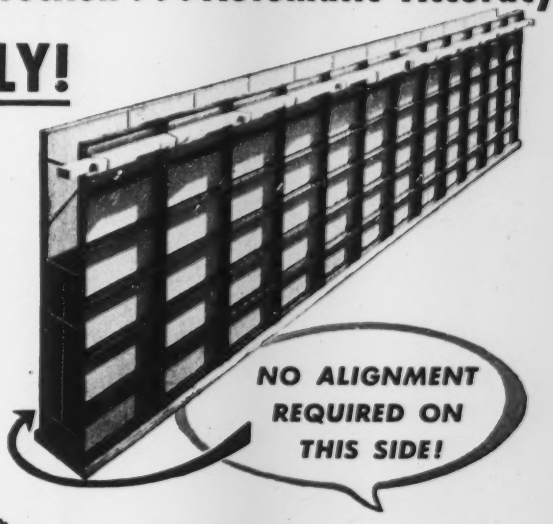

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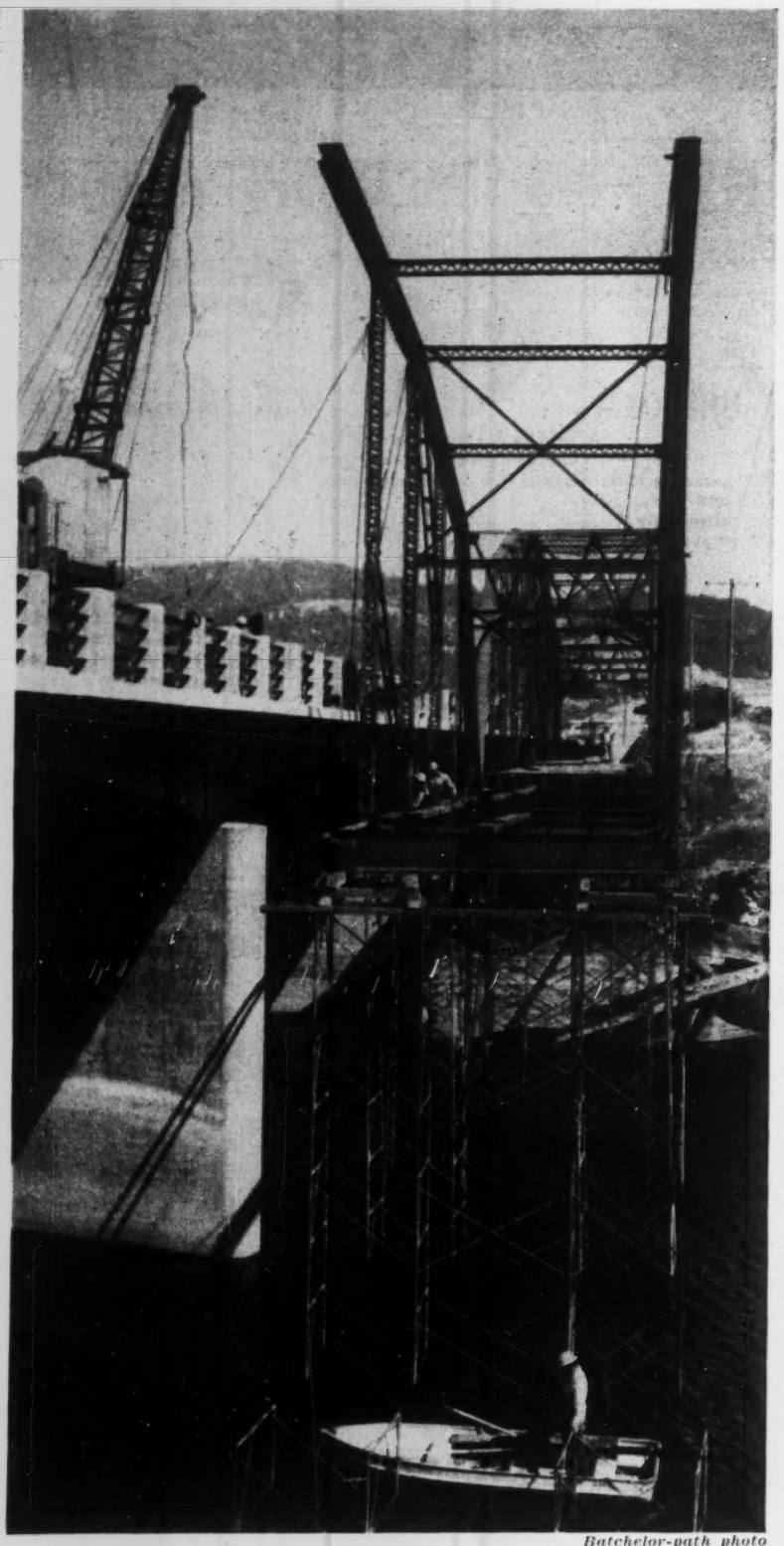


Batchelor-path photo

OLD BRIDGES NEVER DIE

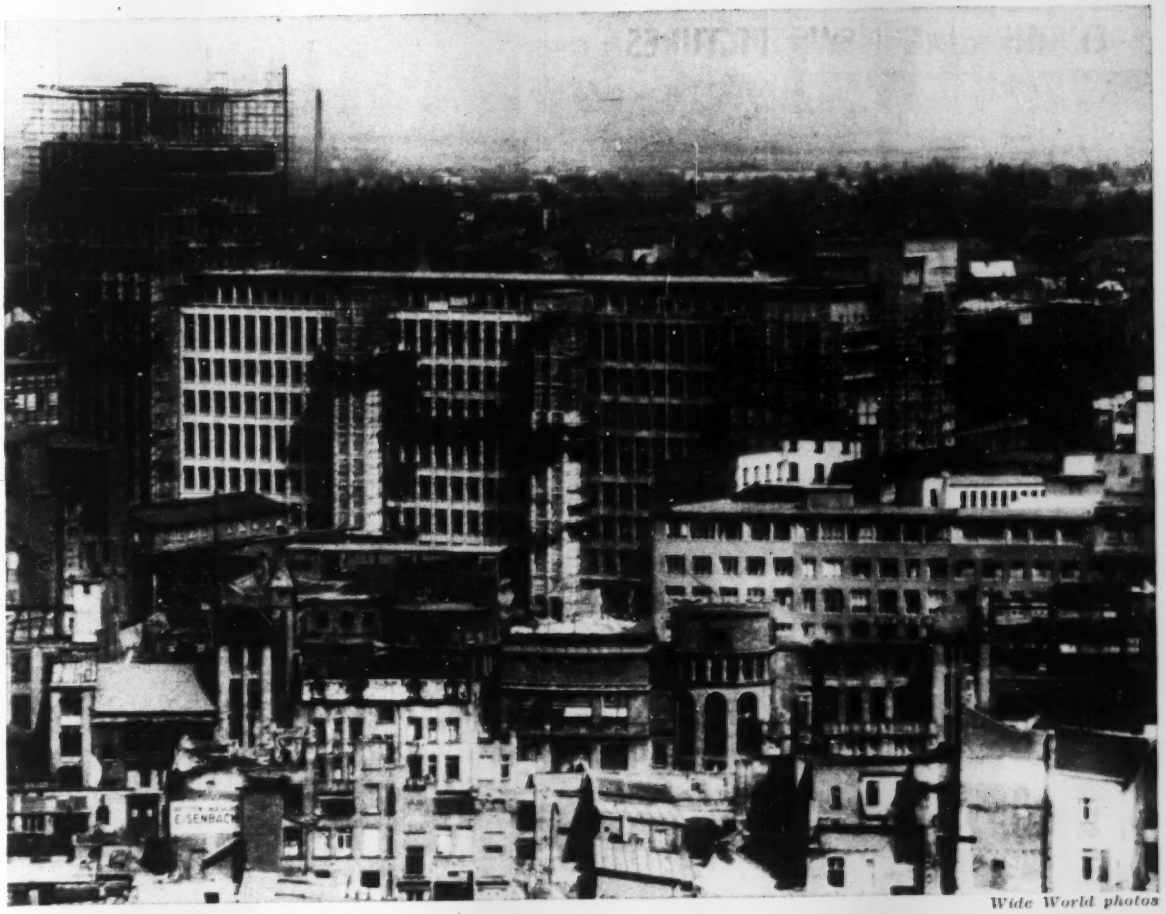
With completion of a new $220,000 concrete bridge across the Spokane River in Washington, the old 80-ton steel bridge, built in 1909, is not destined for the junk heap. Instead, it is being dismantled for re-erection across the Wenatchee River in Chelan County. Price of the old bridge was $1, and according to Spokane County engineer Clyde J. Chaffins, the county made $13,999 on the deal because officials figure it would have cost the county $14,000 to demolish the old structure.

FRANKFURT CALLING

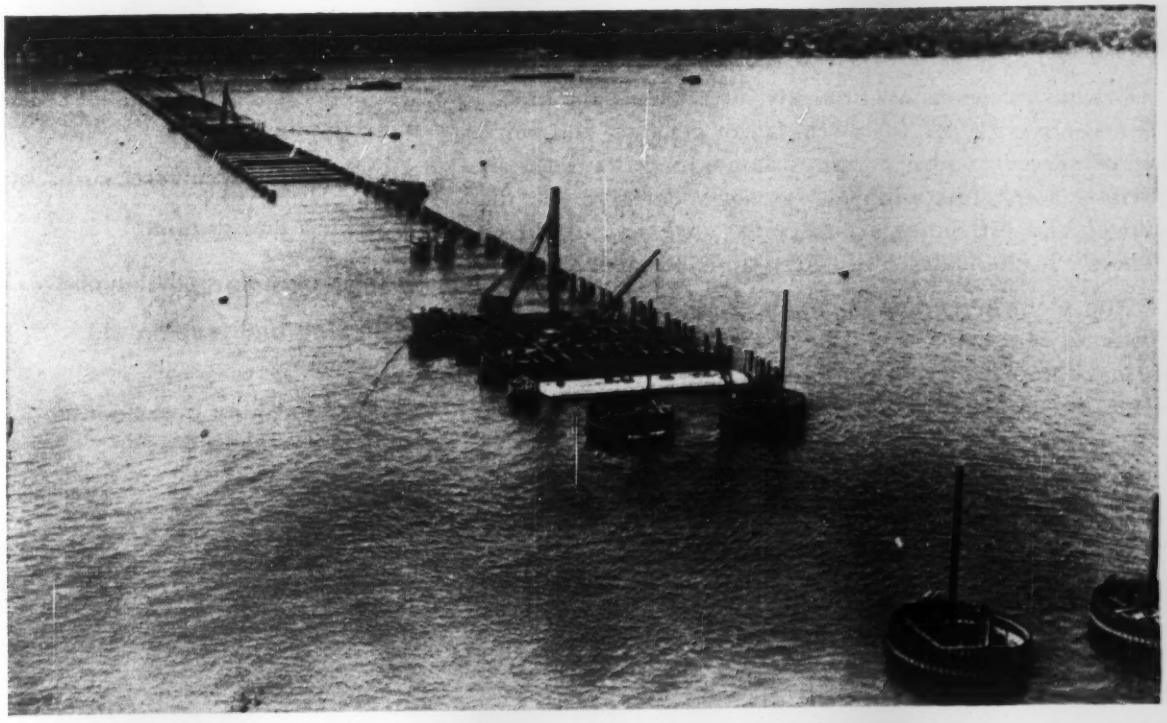
Rising near the center of war-scarred Frankfurt-on-Main, Germany, is this new telegraph and communications center—biggest in the country. It was started two years ago and is scheduled for operation next year. The center will consist of four steel-framed buildings, seven, eight, nine and ten stories high. The buildings will flank two towers 12 and 13 stories high—the tallest containing the center's antennae. Basement of the buildings will house power plants and four carrier frequency channels. These will provide for long-distance direct dialing all over West Germany and will handle overseas telephone and telegraph service. Occupying about 642,000 sq ft, the buildings will contain about 10,000 tons of steel and more than 50,000 tons of concrete.

THRUWAY'S BIG BRIDGE

Foundations for the Tappan Zee Bridge string across Hudson River where it is 3 mi wide. This view, westward, shows the Construction Aggregates Corp. (New York) portion of bridge and circular cofferdams (lower right) of Merritt-Chapman & Scott (New York) work for remainder of bridge. MC&S foundations will include buoyant-box support of main span of a 2,424-ft cantilever bridge to be completed late in 1954 (ENR July 9, p. 33). This completion date will coincide with the opening of the New York-Buffalo New York Thruway, of which Tappan Zee Bridge is a vital link.



Wide World photos



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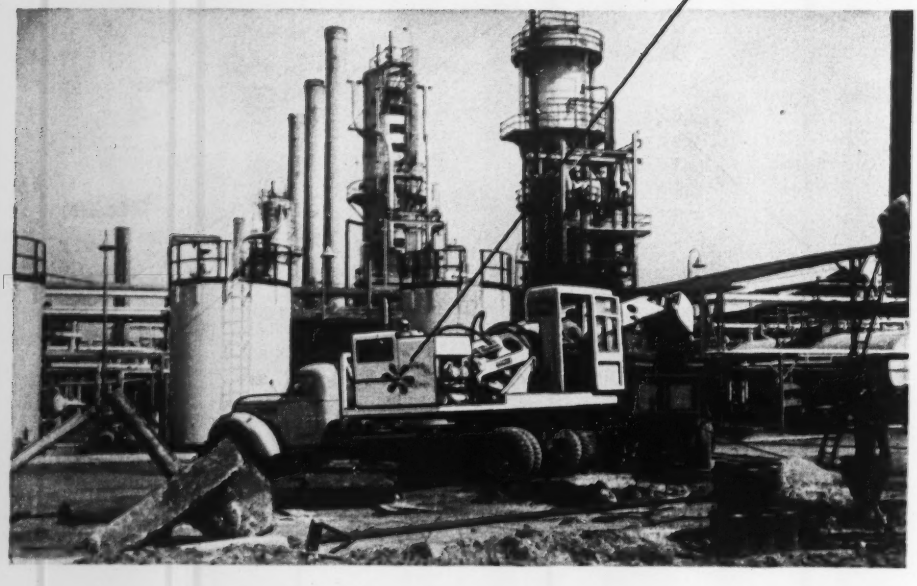

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Collins Construction Co. photos

Nearly eight miles of heavy-duty 20-in. oil pipe line were welded in sixteen 2,500-ft sections at two pipe-assembly yards near St. Ignace, Mich., in preparation for . . .

Two big pulls at Mackinac Straits

Pipeliners, it seems, can run a pipe under, over, or around almost any obstacle. And they do it mostly without fuss or fanfare—breaking records for size of pipe; establishing a new speed record; or surmounting incredible construction difficulties, all as part of the job.

But a new nomenclature will be needed for the twin 20-in. pipe lines being rushed to completion this season beneath the Straits of Mackinac. Some may call them the "Deepest-Inch" since they will reach a maximum depth of 243 ft below water level.

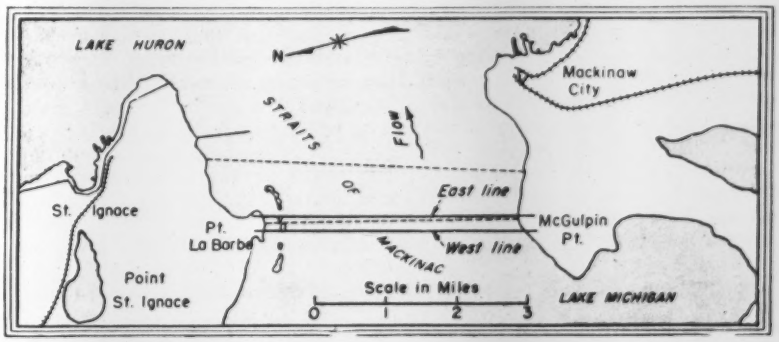
The biggest, and most uncertain problem of the entire undertaking was pulling the pipe across the bottom of the straits—a distance of nearly 20,000 ft from shore to shore. After months of preparation, including dredging, assembling and welding the pipe, and stringing the pulling cable across the straits, pulling of the west line was begun Aug. 9.

A broken drum-shaft on the pulling winch delayed the operations for more than 24 hours (ENR, Aug. 13, p.22) but the crossing was successfully completed on Aug. 15. The east line is scheduled to be pulled across the straits early in September. The total pulling time for the west line was 34 hours, 19 minutes, at an average speed of 10.2 ft per minute.

The $8.3-million straits crossing is part of a 643-mile, $75-million pipe line project being constructed by the Lakehead Pipe Line Company, Inc., from Superior, Wis., to Sarnia, Ont., located across the St. Clair River from Port Huron, Mich. The remainder of the line from Superior to Sarnia will be a single 30-in. pipe line, passing beneath four navigable rivers, 41 other rivers, making 47 railroad crossings, and many other crossings over roads and highways.

• **Eliminate winter bottleneck**—The entire project is scheduled for completion and crude oil will begin flowing through the 643-mile line by December of this year. The primary purpose of the new pipe line is to eliminate a serious winter bottle-neck in the delivery of crude oil to refineries in Sarnia.

In the past, a $90-million pipe line system (constructed in 1950) trans-



BOTH 20-IN. PIPE LINES are launched at Point La Barbe near St. Ignace on the north shore and pulled across the bottom of the straits to McGulpin Point near Mackinaw City—a distance of 20,000 ft.

ported Alberta crude oil from the vicinity of Edmonton to the head of the Great Lakes at Superior. From there it was shipped by tankers to various ports on the Great Lakes, primarily to Sarnia.

This was a seasonal operation, however, since the Great Lakes are closed to navigation about 5 months of the year. Completion of the new Superior-Sarnia line will permit delivery of the crude oil to Sarnia the year around. Transportation costs of the delivered crude oil are expected to be reduced and the new line should encourage the construction of additional refineries along its route.

• **Pump 120,000 bbl per day**—The completed line will go into operation with a capacity of 120,000 bbl per day, and a single pumping station at Superior, Wis. Provisions have been made in designing the pipe line to increase its capacity to 300,000 bbl per day, by the addition of five more pumping stations.

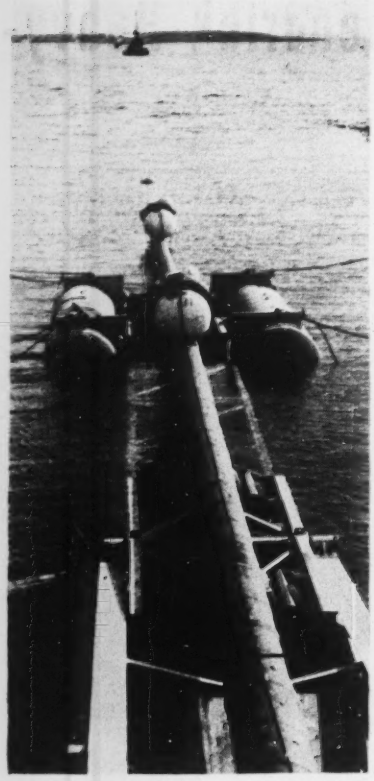
It will take 2,800,000 bbl of crude oil to fill the 643-mile pipe line. At current prices the value of this oil will exceed $6 million. When in full operation the oil will flow at rates up to 3 mph.

The two lines of welded steel pipe will be parallel, located 1,300 ft apart on either side of a submarine telephone cable serving the Upper Michigan Peninsula. The west line was pulled from Point LaBarbe about 4 miles west of St. Ignace on the north side of the straits, to McGulpin Point just west of Mackinaw City. The east line will be pulled in like manner.

• **Major operations**—After the center lines of the two 20-in. pipe lines had been established and sonic surveys made of the bed of the straits, the major marine operations included: Dredging the trenches out from each shore to provide a 15-ft minimum cover over the pipe until they reach an elevation of −65 ft below water level; deep water dredging to remove high spots along the bed of the straits; stringing the pulling cable; and launching the pipe and pulling it across the straits.

Major land operations included: clearing and grading pipe assembly yards; assembling and welding the pipe into eight 2,500 ft sections for each crossing; and cleaning, priming, coating, wrapping and sheathing it ready for launching.

• **Dredging operations**—An estimated 750,000 cu yd of material was removed by dredging in preparing the bed of the straits to receive both pipes. The shoreward portions of both lines lying above an elevation −65 ft below



ARTICULATED PIPE LAUNCHER, with its floating pontoon unit, minimized bending stresses in the heavy pipe during transiton from land to water. Pulling winch was anchored 4 miles away on the far shore.

water level will be buried in trench, with 15-ft minimum cover. This involves trenching and burying about 7,500 ft of the west line and 8,300 feet of the east line. The remainder of both lines will lie directly on the bed of the straits.

A fleet of six big dredges did the underwater excavation. They included: The dipper dredge Mogul with its 50-ft stick and 12-cu yd bucket, owned by the Great Lakes Dredge and Dock Co.; the hydraulic dredge Niagara with 86-ft ladder and 22-in. discharge line, owned by the Duluth-Superior Dredging Co.; the dipper dredge Sullivan with a 40-ft stick and 9-cu yd bucket; and three 4-cu yd clamshell dredges on derrick boats. All clamshells and the Sullivan are owned by the Merritt-Chapman and Scott Corp.; general contractors on the project.

In general, the depth of excavation below water level determined where each dredge worked. The Sullivan excavated the pipe trench down to the limit of its dipper stick, −40 ft; the Mogul to −50 ft below water level; the Niagara to −56 ft; and the clamshells to grade at −65 ft below water level. The clamshell dredges also worked in deep water removing humps, or high points, on the bed of the straits to receive the pipe. All underwater excavation was based on sonic soundings by a fathometer boat.

The hydraulic dredge discharged its spoil through about 1,000 ft of pontoon line into 50 ft of water or deeper. Material excavated by the other dredges was loaded into big dump scows, towed about ½ mile and dumped into 100 to 150 ft of water.

• **Laying the west pulling cable**—Stringing the 22,800 ft of 2-in. and 1¾-in. wire rope pulling cable across the bed of the straits for the west pipe line—from the pulling winch located 2,600 ft back from the south shore, to the north shore—in itself was a major marine task. The cable was laid with the winch barge Cherokee.

To start the 24-hr cable-laying job, the Cherokee first moved into the south shore. Two 2,750-ft lengths of 1¾-in. cable were unspooled to the beach and carried by tractor to the two-drum pulling winch. One length was wound on each drum. A 50-ton towing engine on the barge was loaded with one 2,500-ft length of 1¾-in. cable ,and one end fastened to one of the pulling winch lines.

In the meantime two barge-mounted revolving cranes dropped ten 10-ton concrete anchors, with buoys attached. They were spotted 400-ft each side of the center line of the west cable, and spaced 650 ft apart in each line. Mooring lines from the anchors to the Cherokee kept it on line as it moved out from shore. The barge propelled itself across the straits by two winch lines running to salvage anchors operating ahead of the barge.

As each 650 ft of pulling cable was paid out, a pair of concrete anchors were picked up and moved ahead, keeping the barge under tight control at all times. Every 650 ft the Cherokee checked its position on line and put a strain on the cable being laid to straighten it.

• **Eight sub-aqueous lengths**—When the entire cable had been laid preparatory to launching and pulling the west 20-in. pipe from the north shore to the south it contained eight sub-aqueous lengths in addition to the land line from the south shore to the pulling winch. Each sub-aqueous length of cable was 2,500 ft long. Starting at the south shore, the first two lengths were 1¾-in. wire rope, followed by six lengths of 2-in. wire rope. As the Cherokee approached the north shore the 2-in. cable was passed ashore and temporarily made fast to a "standing holdback" until ready to start launching the pipe.

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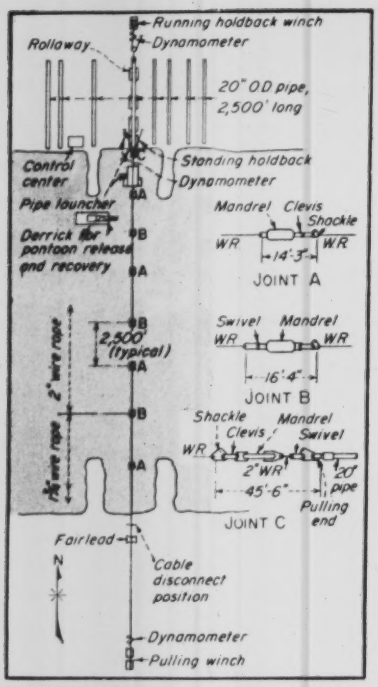


PULLING CABLE was made up of eight 2,500-ft lengths of wire rope plus land section running to pulling winch set back from south shore. Dynamometers at pulling winch, running holdback, winch and standing holdback recorded pulling strains while pipe was being pulled across the bottom of the straits.

Each size of pulling cable was made up of six strands of 19 wires each. The 2-in. and 1⅜-in. cables have breaking strengths of 172 tons and 134 tons, respectively. Their weights per lin ft in water (negative buoyancies) are 6.16 lb and 4.71 lb, respectively.

The north end of the pulling cable was attached to a 20-in. dia pulling plug, welded to the end of the first 2,500-ft length of 20-in. pipe to be launched, by a 45-ft long stringout that included two shackles, a swivel, a clevis, 20 ft of wire rope and an 18-ft long by 30-in. dia mandrel. Smaller mandrels and attachments formed connections between the eight 2,500-ft lengths of pulling cable. The steel cylinder mandrels were slightly buoyant to let them float just above the bed of the straits. The cable, however, was pulled along on the bottom.

• **Pipe assembly**—Records aren't complete on the amount of welding rod and man-hours of labor needed to assemble, weld and prepare the 20,000 ft of pipe for each crossing, but both would be impressive figures.

The pipe is special open hearth Class A seamless steel tubing, 20-in. OD with a ⅜-in. wall thickness. It weighed 166 lb per lin ft in air, but its negative buoyancy in water was reduced to 6 lb per lin ft by steel pontoons lashed on top of the pipe every 65 ft. Specifications required the pipe to withstand a hydrostatic pressure of 1,500 psi. Maximum operating pressure will be 600 psi.

It took a lot of room to assemble and weld the pipe and prepare it for launching. Two areas, measuring roughly 1,000 ft wide and extending about 3,000 ft back from the shore line were cleared and graded to give ample working space.

Pipe sections arrived on the job in 27-ft random lengths. They were welded into 2,500 ft lengths; eight such lengths being required for each crossing. The pipe sections were butt welded together with a 75-deg, full depth weld. It took 8 passes to weld the ⅜-in. thick pipe walls: a root pass, two hot passes, four fillers and a cap weld. The eight 2,500 lengths of pipe forming the west line were assembled and welded on pipe racks paralleling the rollaway launching carriages. A fleet of seven side boom tractors moved each 2,500 ft length onto the rollaway as launching proceeded. The rollaway was made up of 60 launching carriages spaced 45 ft apart. Each carriage contained a set of three 10-ply, 6:00x9 rubber tired wheels for the pipe to roll over as it was launched. The two clusters of tires were mounted in a steel frame which pivoted about the center of the fixed steel frame base to equalize the weight of the pipe at all supports.

• **Cleaning, coating and wrapping**—After the 2,500 ft lengths of pipe had been welded, and the welds X-rayed to insure perfect joints they were cleaned, coated and wrapped. While side-boom tractors held the pipe clear of the supporting rack, a special self-propelled machine running on top of the pipe cleaned it and applied a prime-coat of material having a coal-tar base.

This was followed by a second machine—also self-propelled along the top of the pipe—which coated the pipe with a coal-tar base enamel, and applied two spiral wrappings of glass fiber matting—all in one continuous operation. The entire pipe was then wrapped and banded with 1x3-in. soft timber lagging to protect it during installation.

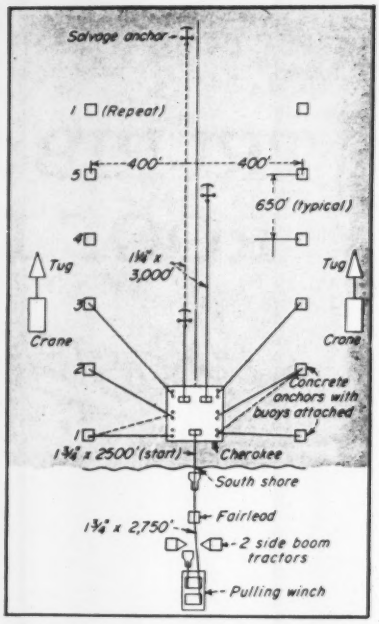
• **Launching the pipe**—Although the north shore slopes gently down to the water line, a special pipe-launching rig—originally developed to launch pipe lines in water subjected to tidal variations—was used to launch the west line, and will be used for the other line.

Bearing the jaw-breaking name, "Hydro-pneumatic Multi-differential Self-stabilizing Pipe-launcher" by its designer, the Collins Construction Co., Victoria, Tex., it provides six articulated points of support to minimize bending stresses in the pipe during launching.

This is the same type of pipe-launcher that was used in pulling a 24-in. welded steel gas pipe line across The Narrows of New York harbor from Staten Island to Brooklyn (ENR, Aug. 13, 1953, p.39).

It is made up of three articulated units: A pivoting truss-frame unit anchored at the shore line, a floating unit supported by two pontoons, and a central 40-ft truss extension arm connecting the shore and floating units. The 120-ft long assembly mounts three pipe carriages, each containing two sets of three pneumatic tired wheels over which the pipe rolls during launching.

• **Pulled from north to south**—The decision to pull both 20-in. lines from the north shore to the south was based on two factors. The north shore, being considerably flatter than the south shore, offered better topography for assembling, welding and launching the pipe. Moreover, there is a deep gorge in the bed of the straits near the north shore and the sooner the pipe was pulled across it, the less were the chances of trouble developing in that area. The gorge is



CABLE STRINGING was performed by the winch barge Cherokee, winching itself across the straits with salvage anchors. Mooring lines running to movable concrete anchors kept the cable-laying barge on its true course at all times.

about 2,000 ft wide, beginning about 6,000 ft from shore and extending from −150 ft to −243 ft below lake level.

• **Winch operations**—The original plan was for two big winches, set 2,600 ft back from the shore lines to pull the west line. A 210-ton two-drum diesel winch on the south shore was to pull the pipe while a 50-ton steam-driven winch with a two-part line on the north side, called a running-holdback, pulled against the other winch to keep the pipe under tension and prevent its over-running itself. When one of the drum shafts on the diesel winch broke, however, it was replaced with a steam-operated winch which completed the job.

The running-holdback winch was steam-operated for more accurate control of its braking operations. A so-called standing-holdback, installed near the edge of the north shore took over and held the submerged pipe under tension while each 2,500 ft of pipe was welded in the line.

The pulling winch was anchored to a 27x16x4-ft thick mass concrete base anchored in solid rock by a welded steel frame containing four 14-in., 73-lb steel beams grouted 10-ft into solid rock with low-shrinkage cement mortar.

The running-holdback winch sat on a concrete base anchored to 12 steel H-beam piles driven 35 ft to refusal. Eight piles were vertical and four were battered.

The standing-holdback was also anchored to pile clusters driven to refusal. It consisted of a welded steel frame set at ground level and a double line of cable extending 75 ft out to engage the end of the last section of pipe being launched. Turnbuckles in each line developed the required tension to hold the pipe while the running-holdback line was disconnected and the next 2,500-ft section of pipe placed on the rollaway and welded in the line.

Dynamometers in the pulling line, the running-holdback line and the standing-holdback line made a continuous recording of the pulling strains, and warned of any impending trouble. The maximum net pull required to pull the west line was 60 tons.

• **Self releasing pontoons**—The 58-in. long, 38-in. dia steel pontoons, spaced 65 ft apart along the top of the 20-in. pipe to reduce its negative buoyancy to 6 lb per lin ft, had a positive net buoyancy of 1,747 lb each. They are so-called self-releasing.

Each pontoon was securely attached to the pipe with two 2-in. strips of strapping steel. After the pipe was in place on the bed of the straits a tumbling block arrangement was employed to cut the two bands simultaneously, thereby permitting the pontoons to pop up to the surface of the water.

A short length of bridle rope was attached to 300-ft of manila rope which, in turn, was fastened to a small steel cylinder buoy. While the pipe was being launched and pulled across the straits the coiled rope and releasing buoy were held on top of the pontoon by means of a ½-in. steel cable running the length of the pipe.

After the pipe had been installed this cable was underrun, releasing the coiled rope and its buoy. The buoy arose to the surface, and a slight pull on the rope cut the two bands, releasing the pontoons.

During all phases of launching and pulling the pipe across the straits short-wave radio contact and direct telephone connections were maintained between the several operations through a control tower located on the north shore.

After the west 20-in. pipe line was installed on the bed of the straits it was to be filled with water to facilitate its settling along the bed of the straits. Filling the pipe was to begin at the low point in the pipe line through a 4-in. pipe inside the 20-in. pipe and extending out about 8,500 ft from the north shore. Installation procedures that were used on the west line will be repeated for the laying of the east line.

• **Men in charge**—T. S. Johnston is president of the Lakehead Pipeline Company, Inc. Robert E. Trammell is general manager, assisted by F. J. Stubbs, and Roger H. Clute is chief engineer.

The Bechtel Corp., San Francisco, acts as agent for Lakehead on the entire 643-mile, $75-million project. They prepared the designs and are coordinating and supervising all construction. Clark Rankin is project manager, reporting to Van W. Rosendahl, senior vice-president. H. D. Barker is project engineer; Jack V. Chambers, administrative manager; and J. D. Creveling, lands manager—all operating out of the field headquarters office which is located in Saginaw, Mich.

Bechtel engineers in direct charge at the straits include: E. F. Quiett, construction manager; V. R. Stirling, assistant construction manager, assisted by H. O. Long and T. L. Geiger; and G. M. Zack, inspector on marine work.

Merritt-Chapman and Scott, Corp., Cleveland, Ohio, are general contractors on the $8.3-million twin pipe line crossing at Mackinac Straits. Their operations are supervised by Sherman H. Serre, vice-president; Joseph S. Troxell, project manager; John I. Tooker, pipe-pulling superintendent; Donald McGregor, dredging superintendent; R. C. Candler, tug and equipment superintendent; and project engineers Pat Ryan and James E. Surprenant. F. E. Krauss is structural engineer.

Welding, cleaning, coating and wrapping the pipe at the straits was done by Midwestern Constructors, Inc., Tulsa, while the pipe-launching, pulling, and flotation equipment was rented from the Collins Construction Co., Victoria, Tex.

All top-level decisions regarding construction procedures at the straits are made by a joint board comprised of: Ray L. Hamilton, of the Bechtel Corp.; Serre, Troxell and Tooker, of Merritt-Chapman and Scott Corp.; and Sammy Collins, of the Collins Construction Co.

PRE-LAUNCHING OPERATIONS—The first 2,500-ft length of 20-in. pipe, with pulling plug welded onto its front end, was jockeyed out over the rear unit of the pipe launcher ready for the pulling cable to be attached. Two self-releasing pontoons lashed on top of the pipe kept it from nosing into the bed of the straits during pulling.

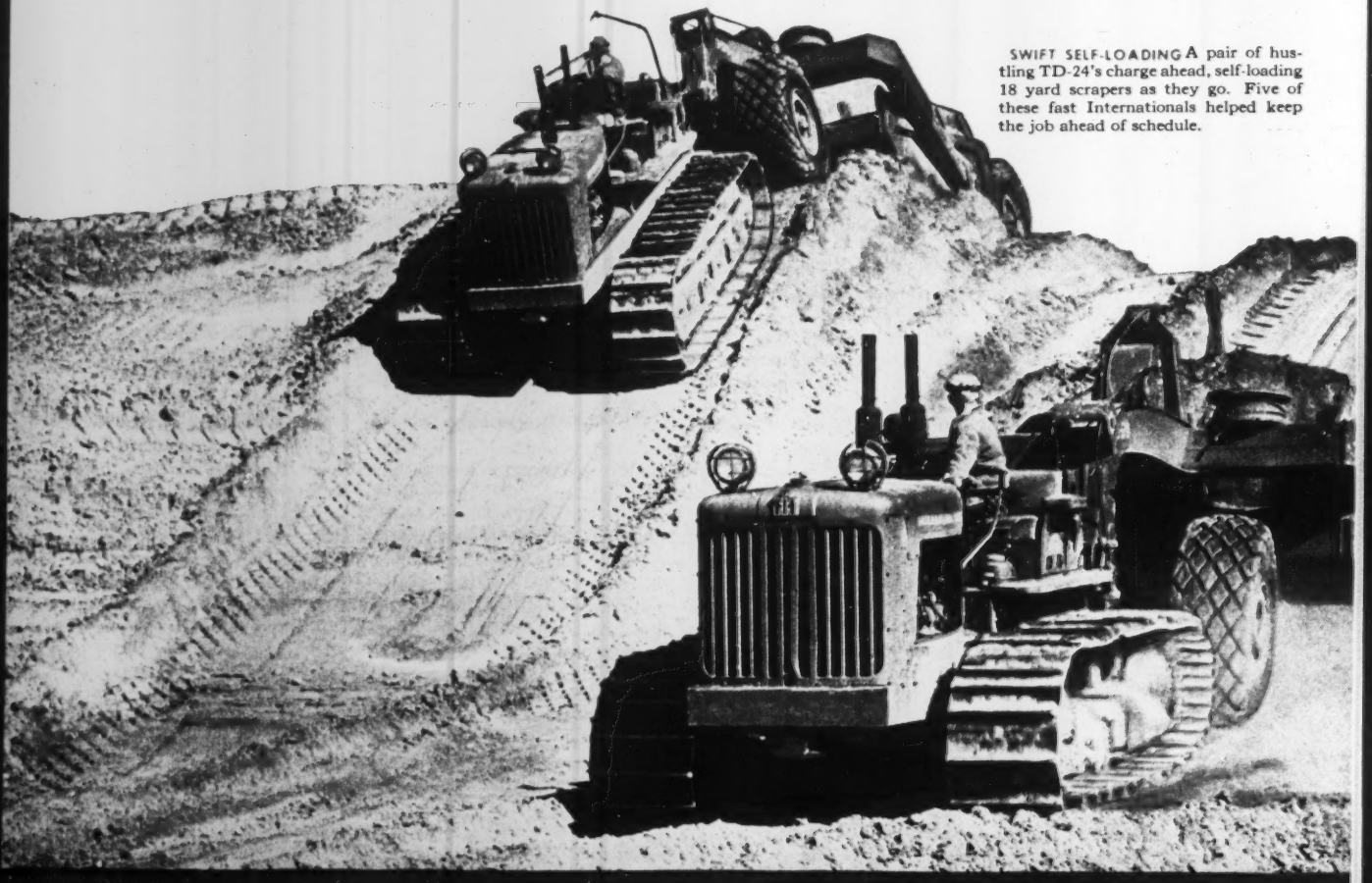
"Big Red"

Contractor completes job 45 days ahead of estimate as TD-24 fleet moves a million yards

Ryan Construction Company, Evansville, Indiana, took on a big job when they contracted to move a million cubic yards of dirt and place 35,000 tons of riprap in site preparation for a new steam generator plant on the Ohio River.

From the first day on the contract, Ryan's five TD-24's made the dirt fly. Their assignment: to cut down two hills and dump the excavated material in old creek bed to make a new power plant site.

They averaged 4 minutes and 40 seconds on the 2,000 foot round trip between cut and fill. Self-loading heaped



SWIFT SELF-LOADING A pair of hustling TD-24's charge ahead, self-loading 18 yard scrapers as they go. Five of these fast Internationals helped keep the job ahead of schedule.

TD 24 Rolls for Ryan

scrapers, the Big Red fleet moved tremendous yardages every day—kept doing it even in rain and mud, the Ryan people report.

TD-24's are the fastest and most powerful crawlers on the market. That's why "Big Red" performance is paying off not only for Ryan but for contractors across the country who need big crawler power to get tough jobs done on time.

And you can't beat the service provided by your nearby International Industrial Distributor. His trained servicemen, complete stocks of parts and up-to-date shop facilities are available to you anywhere, anytime to keep your equipment in production.

He and the famous line of IH crawlers he sells are willing and able to help you put your contract on a paying basis.

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POWER STEERING WITH FULL LOADS mean faster cycles, higher daily production. Because "Big Red" steers with full power on both tracks, it can maneuver with the same heavy loads that can be pulled on the straightaway.

WATCHING BIG RED ROLL Ryan Construction men keep close tabs on the performance of their five TD-24's. Cycles are clocked for half an hour every morning and afternoon. Left to right: Guy Tilley, Job Superintendent, Tom Vickers, Job Foreman, and Virgil Scales, Superintendent.

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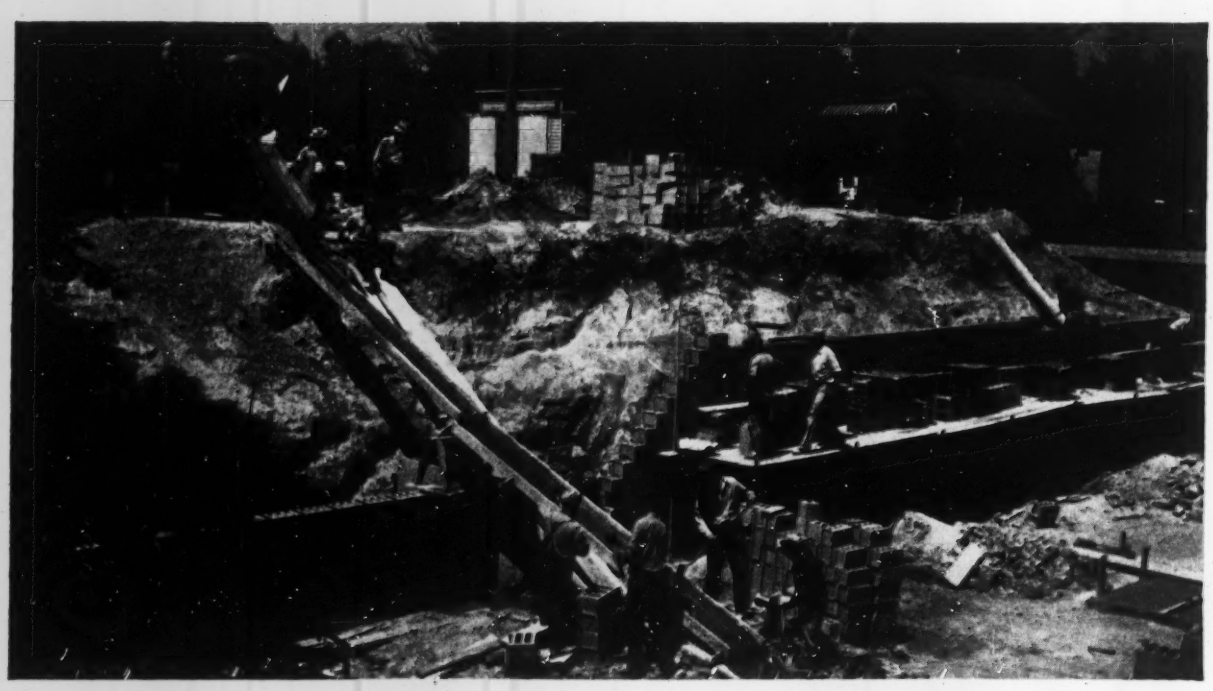

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The greater plasticity of the mix, induced by Dowflake, makes it possible to decrease the amount of water which would otherwise be necessary to make the concrete flow. This reduction in gauging water reduces shrinkage and surface crazing and provides a denser, more waterproof concrete.

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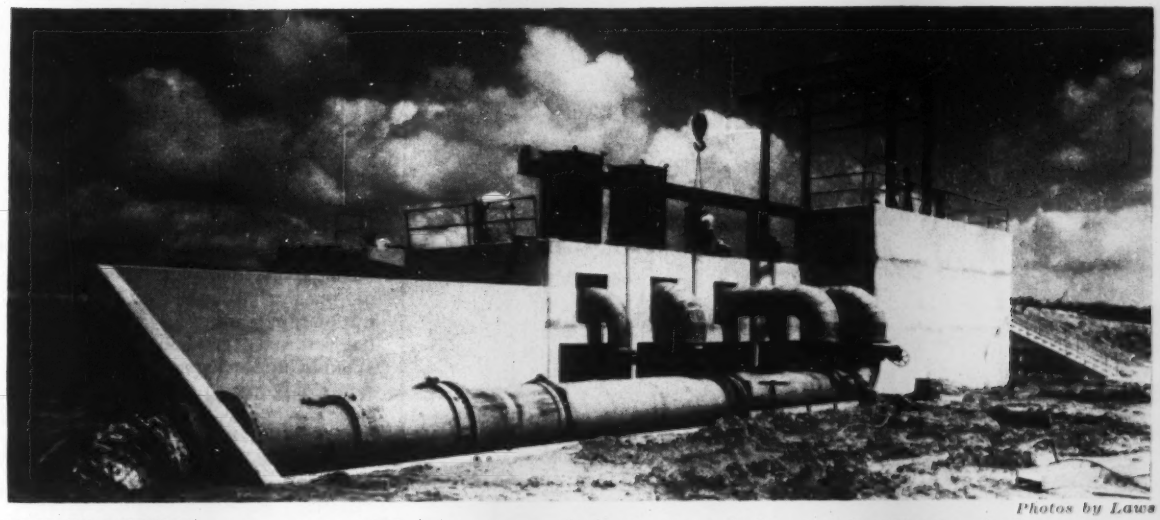


Photos by Laws

OUTDOOR PIPING serves raw water to industry from pump station that also feeds Houston's first filtration plant.

Waterworks gets outdoor industrial look

This is the second of a series of two articles on waterworks construction at Houston, Tex. The first, covering the dam with novel spillway on San Jacinto River, appeared Aug. 20, p. 43.

Water from behind Houston's new San Jacinto Dam will flow in a canal, now being concrete-lined while in use, to the city's first filter plant, notable for its industrial, open-air design.

Through motor-driven sluice gates, spaced to take water into an intake tower from desired depths, will come up to 200 mgd; two 72-in. conduits will take this flow to the river pumping station. Vertical centrifugal pumps (initially four, totaling 220-mgd capacity) will be housed in a 30x117-ft structure founded in clay on 20 piers with 10-ft dia under-ream footings.

Water flowing in an existing earth canal from present pumps to industrial users must be kept flowing while the canal is lined with concrete. Lining—it is expected—will boost present delivery of 50 mgd to 200 mgd by improving carrying capacity and eliminating seepage losses along the 13.2-mile length.

Existing Sheldon Reservoir on the line from the river to Houston will be put out of use by building the canal right through it between dikes.

Canal dimensions will form a trapezoidal section with bottom widths 6 and 8 ft, depending on gradient. Existing alignment has been straightened in places; existing siphons are to be enlarged with parallel pipes in some spots, replaced by culverts in others.

Canal lining with reinforced concrete (it was bid under guniting) must not interrupt present delivery of 40 to 50 mgd. The low bidder, Brown & Root, Inc., Houston, will by-pass the flow through a temporary channel as it unwaters and lines a section of canal at a time.

The canal will terminate in a forebay already built at the treatment works, a diked enclosure with sides paved to prevent erosion and seepage losses.

• **The filter plant**—Houston's first water treatment plant will follow the modern trend in Gulf Coast industrial design, and will be free of the architectural pretensions found in many older water plants. Taking full advantage of mild climate and adequate space, designers have based layout entirely on functional considerations, yet the result is architecturally correct and pleasing in appearance. (Also being built by Brown & Root.)

Constructed for a nominal capacity of 50 mgd, the plant is equipped for an initial capacity of 30 mgd, and space is available for expansion to as much as 200 mgd. The plant and its pumping facilities are claimed to be capable of efficient operation at 200% of these capacities.

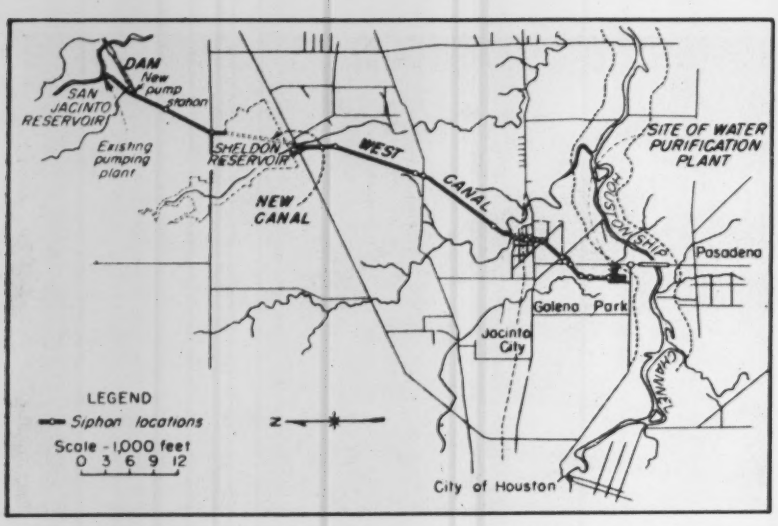
A separate pumping station, operated in conjunction with the purification plant, will supply raw water up to 75 mgd to industries along Houston's highly industrialized Ship Channel.

• **Process**—The treatment process will be reasonably simple. San Jacinto River water is low in hardness, alkalinity, and turbidity, but may pose some problems with taste, odors, and color. The city has maintained a careful record of water quality, with complete chemical analyses taken at two-week intervals for the last 20 years, and has conducted extensive pilot plant studies to reveal the treatment problems which might be encountered. The pilot plant studies indicate that pre-chlorination, coagulation with alum, settling, filtration, and stabilization with lime will yield a high quality water. Treatment with activated carbon for tastes and odors may be required at times.

Raw water from the Lake Houston Reservoir is to be lifted from the canal forebay to measuring flumes and rapid-mix units, where coagulant will be added and mixed. Flocculation and settling follows in three basins, after which the settled water flows directly to twelve filters. Finished water is pumped to storage and will flow by gravity to the main pumping station, for delivery to the distribution system.

Each of the three treatment basins will be equipped with seven, three-stage, axial-flow flocculator units. The settling basins are equipped with radial sludge collecting mechanisms, with corner rakes. Treatment basins are sized to give satisfactory treatment at double the nominal plant capacity.

• **Lessons from industry**—Basic design of the plant makes use of the latest developments in equipment, materials, and methods used in the refining and chemical industry, but does not depart from time-tested principles of municipal water treatment. A substantial part of the product (water) piping is eliminated by building the filters parallel to the discharge ends of the settling basins and using the intervening space as a two-story channel for treated water and for wash-water dis-



CANAL CONNECTING reservoir to plant must be concrete-lined while in use.

posal. This arrangement results in the elimination of over half of the piping found in the conventional pipe-gallery and permits a substantial reduction of width in the gallery itself. Large windows afford light and ventilation to the gallery.

The 12 filters are designed for a net yield of 2 gpm per sq ft of filter area at the nominal design rate, after allowance for washing. Each filter thus has a nominal gross capacity of 4.17 mg per 24 hours—an aggregate net yield of 50 mgd.

Filters are arranged in pairs with wash-water gullets on opposite sides of the common wall. This permits an unbroken sand area over the entire effective surface of the filter. Wash-water troughs are of precast concrete, using light-weight aggregate, and cast in special steel molds. Filter underdrains are constructed of perforated ceramic blocks, except one filter, in which carborundum porous plate under-drains are used. Filter sand produced locally is an excellent quality of silica sand meeting AWWA specifications for "medium" filter sand. Filters are equipped throughout with rotary surface-wash equipment.

• **Use of steel**—An outstanding feature of the plant is the use of fabricated steel pipe as well as reinforced concrete pipe for large lines. In the Houston area, fabricated steel pipe in the larger sizes is lighter and more economical than cast-iron, and also offers greater dimensional flexibility, according to designers Freese, Nichols and Turner. Interiors of all steel lines are protected from corrosion by special enamel coatings.

All low-pressure valves, including those controlling filter operation, are of the rubber-lined butterfly type. The use of these valves results in substantial space saving, and in this case, a direct reduction of cost in valves alone of $124,000 over the in-place cost of conventional gate valves.

Following industrial practice, the city of Houston has for years built its surface storage reservoirs of welded steel, finding the cost of construction and maintenance less than for concrete. Accordingly, the purification plant will use steel tanks for clear-well and wash-water storage. Likewise, bulk storage of coagulant and lime will be in outdoor steel bins served by mechanical conveyor systems. Storage of chlorine for the plant, and for use at the city's well-fields, is also out-of-doors, with shed protection against the summer sun.

Activated carbon in bulk will be stored and handled as a water slurry to eliminate the problems of dusting and fire. Following the technique developed at Chicago's South District plant, carbon received in hopper-bottomed railway cars will be unloaded directly into slurry tanks equipped with mechanical and air agitators. Slurry will be measured by feeders and pumped to points of application. The plant is also designed to handle and feed liquid alum as well as the more common crystal form. The proximity of dependable sources of liquid alum appears to offer opportunities for substantial savings in coagulant costs.

Substantial savings in pumping station costs have been effected by use of vertical mixed-flow, submerged pumps in outdoor stations for raw-water lift and for filtered-water lift to the clear wells. A similar installation, using multi-staged turbine pumps will supply raw water to industries. Drive units for the rapid-mix chambers are likewise located out-of-doors. The distribution pumps, however, are housed in a conventional station, because of the larger motors, and to facilitate maintenance of horizontal pumps and cone check valves.

• **Power and control**—Power service to the plant will be from alternate 69-kv taps from two major feeders of the Houston Lighting and Power Co. Proximity of the plant to two of the company's principal generating stations will make possible the use of crossline starting equipment on all motors, including the 2,250-hp distribution-pump motors. A 1,000-hp gas engine-driven generator will furnish stand-by power for the industrial water pumps. Power to all motors over 150 hp is at 4,160 volts and to smaller motors, 440 volts.

Primary operational control of the treatment process centers in the filter operating gallery. Here the chief operator will control the raw-water and filtered-water transfer pumps, and the filters themselves, so as to maintain adequate clear-well storage at all times. The 12 filters are equipped with direct-acting hydraulic rate controllers, which automatically proportion the flow of settled water to all operating filters. Chemical feed is automatic, controlled by the flow of raw water through twin Parshall flumes. An attendant in the chemical building services the chemical-feed equipment, and varies the chemical dosage in accordance with periodic instructions from the laboratory. Sample-water lines from critical points in the process flow directly to the laboratory where continuous tests are made for product control.

A central instrument panel on the second floor of the administration building, adjacent to the laboratory, indicates and records operating information from every step in the process. At this panel it will be possible to trace the operation of the entire plant throughout each 24-hour period.

An interesting and unusual feature will be the use of large colored graphic panels above the central instrument panel, the plant control panel, and the control panel for the chemical bulk-handling equipment. This is an adaptation from refinery practice, in which a colored flow-diagram is installed over the operating panelboard, with each instrument color-coded to the point on the flow-diagram from which the measurement is taken. The graphic panel system aids in training new operators and is most instructive to visitors.

The plant laboratory and administration building is integral with one end of the filter operating gallery, with staggered floor levels arranged to display the expanse of open filters and treatment basins to the best advantage. The first floor houses administration offices, men's locker rooms, and a

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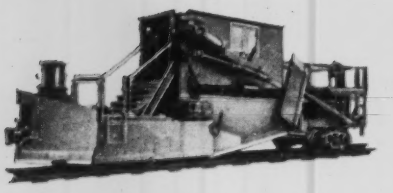

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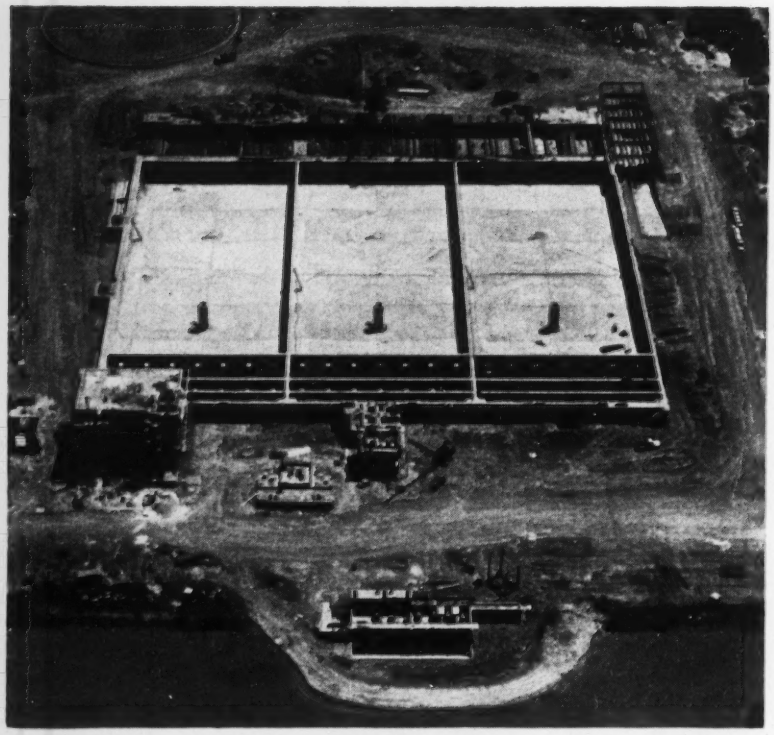


FIRST FILTER PLANT FOR HOUSTON has outdoor pumps, basins and chlorine storage. Features also: Extensive steel piping with butterfly valves, compact two-story channels to bring raw water to—and wash water from—filters.

classroom for operators and other training purposes. The second floor houses the main laboratory for the entire Houston water system, the main instrument panel, and ladies' locker rooms. The building is air-conditioned, with windows of green heat-absorbing glass. Interior finish of the administration building and laboratory, the filter gallery, and the operating area of the chemical building make use of colored architectural tile walls and terrazzo floors. Laboratory furniture is colored to harmonize with wall and window colors.

• **Costs**—Total contract cost of the purification plant is $4,850,000, of which $385,000 is for the industrial pumping station. Water will leave the purification plant in a discharge main for municipal supply approximately 7.5 miles long, leading to a connection with the city's existing water distribution system in the southeast part of the city. This main will carry a maximum of 25 mgd under a static pressure at ground level of 110 psi from the distribution pump station. Plans call for building a second large main at a later date.

Connections will be made en route with all 12 and 8-in. mains intercepted in order to strengthen the present gridiron of the existing distribution system of the city, and it is estimated that 21 mgd will be delivered at the end of this distribution main with a static pressure at ground level of 60 psi.

The distribution main will be of the following sizes: 36, 30, 20 and 16 in. The 36 and 30-in. mains will be steel pipe, coated and wrapped outside and coated inside. It will be coupled at joints rather than welded, as a result of economy study.

Million-dollar research center is planned

Plans for the construction of an engineering research center on the Oklahoma A&M college campus at Stillwater have been revealed by Clark A. Dunn, director of engineering research at the college.

The project calls for the construction of a first wing at an approximate cost of $1,000,000. Three others are to follow in the future as the demand arises.

The four-story structure will provide 62,000 sq. ft. of research work space and will be air conditioned and fire resistant.

The building will be financed by revenue bonds to be retired by rental. It will serve students interested in various phases of engineering research conducted at the center by college personnel, and regional and national research interests.

RELATIVELY NEW METHOD of sewer construction at Bay City, Mich., required no tunnel liner or roof bracing. Short sections of elliptical pipe are passed through previously laid pipe, rotated and pulled back into final position by a special pipe-laying rig.

Progressive tunneling works without use of liner plates

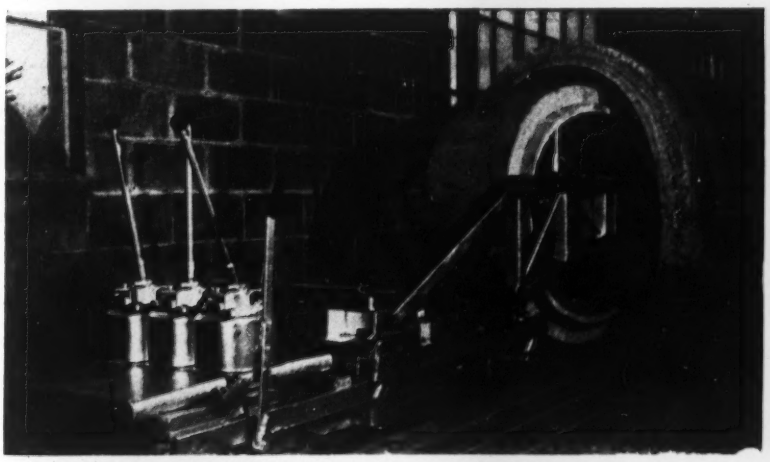
When the Northern Kentucky Sanitation District awarded a $4.5-million contract early last year for the construction of a sewage treatment plant and collector system it was assumed that the sewer lines would be built by conventional methods.

But the contractors have completed the construction of 6,940 ft of the sewer by a relatively novel method, which has been gaining in acceptance by municipalities during the last two years. In this process no liner plate or shoring was needed for driving the tunnel or installing the reinforced concrete pipe. Sections of the sewer pipe were transported through previously laid pipe and set in place at the heading which was kept excavated only a few feet ahead of the pipe.

The method was developed by the Lamar Pipe and Tile Co., Saginaw Mich., which was purchased this spring by the American-Marietta Co., Chicago.

The 6,940-ft sewer was completed on Aug. 1 of this year. When the entire project is completed in July, 1954, it will serve several industries and 139,000 residents of 16 communities, including Covington and Newport, Ky. (ENR May 22, 1952, p. 45). The 38-mgd treatment plant is located downstream from Covington, across the Ohio River from Cincinnati.

• **How it worked**—The principal feature of this method of pipeline construction lay in the size and shape of the tongue-and-groove precast sections of reinforced concrete pipe. They were cast elliptical in shape, with a ratio length to width that permitted one section to be passed through the previ-



BATTERY OPERATED TUNNELUGGER moves elliptical pipe section through previously installed line (at left) until it emerges at the heading (at right).

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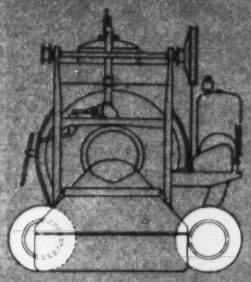
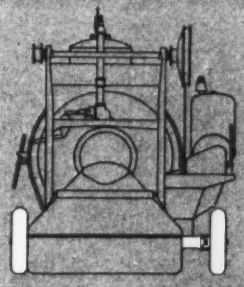


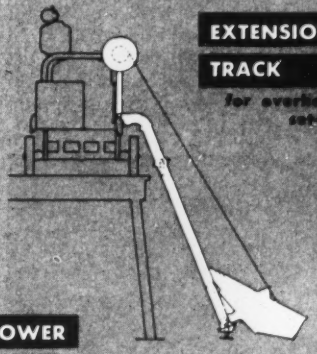
INTERCHANGEABLE SIDE OR END DISCHARGE

readily adapts mixer to suit operating conditions



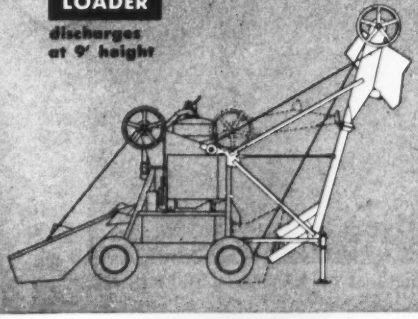
EXTENSION TRACK

for overhead set-up



TOWER LOADER

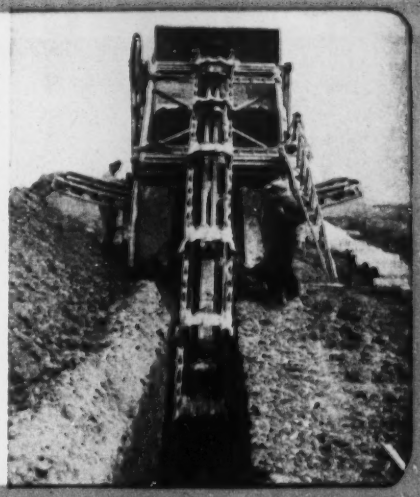
discharges at 9' height



17-FT.-DEEP Parsons 310 Trenchliner®

With 45 digging feeds, this big-capacity 310 Trenchliner produces from 8" to 15½' of clean, smooth-walled trench per minute . . . digs 1½ to 4½' wide at 17' depth with single boom, and up to 6' wide at 11' depth with dual booms. 310 has full reverse of all operations for undercutting or making vertical set-ins . . . is equipped with easy-in, easy-out "Tap-In" teeth. Parsons line also includes 5 Trenchliners in smaller sizes.

PARSONS *(Koehring Subsidiary)*
Newton, Iowa



EASY-CHARGING Johnson Lo-Bin Batcher®

Lo-Bin Trolley Batcher holds 8, 20 or 30 tons . . . is only 7½' to 9½' high for charging with front-end tractor loader. Lo-Bin has 2, 3 or 4 compartments, up to 4 weigh beams, 22 or 44 cu. ft. weigh hopper . . . or can be arranged for 2 or 3 aggregates and 1 bulk cement compartment. Efficiently serves 28-S, 16-S, 11-S, 6-S mixers. Lo-Bin is quickly dismantled, easily moved by dump truck. Optional: wheels, tires, tow-bar.

C. S. JOHNSON *(Koehring Subsidiary)*
Champaign, Illinois

86.7-BATCH-PER-HOUR Koehring *twinbatch*

Koehring 34-E paver hits a top output of 86.7 batches per hour (60-second mixing time). This reserve work capacity offsets normal production delays . . . assures an average of 50 batches an hour, 8 hours a day, at no increase in batching, hauling or finishing equipment. Every mixing operation is automatic, accurate, fast with split-second Autocycle control. Get more facts on big Koehring 34-E *twinbatch*. Also check rubber-tired 16-E.

KOEHRING COMPANY,
Milwaukee 16, Wis.

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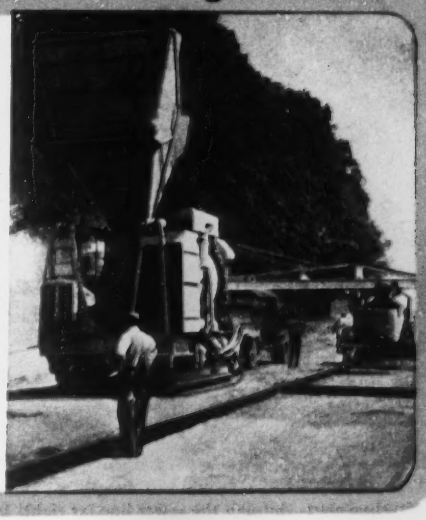
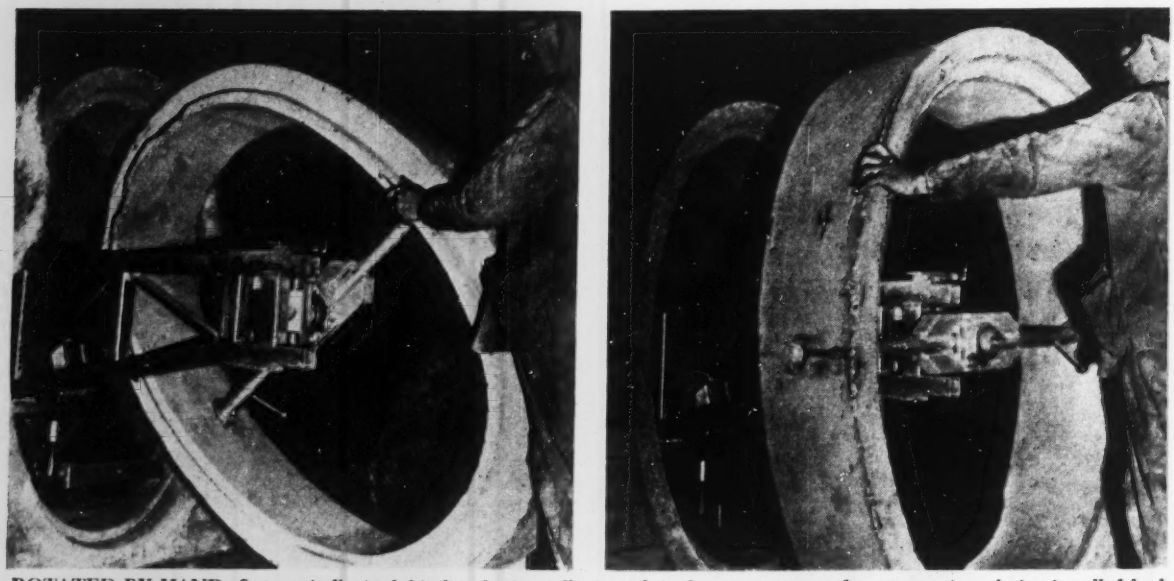




ROTATED BY HAND, first vertically (at left) then horizontally (at right), the new tongue-and-groove section of pipe is pulled back into final position by the pipe-layer.

ously installed portion of underground sewer.

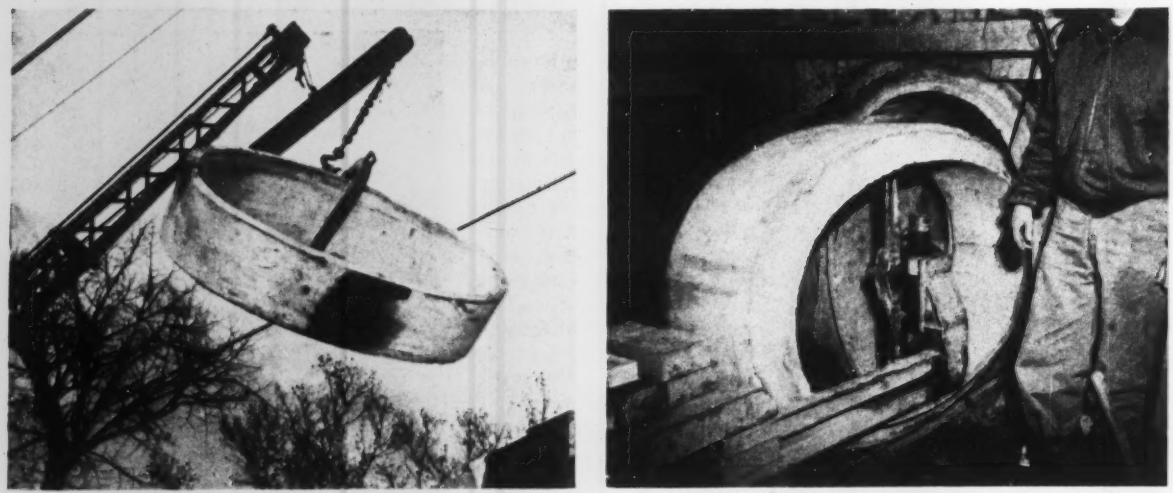
Sections of the pipe were picked up by a special L-shaped hook and lowered into a work shaft by a truck crane. They were mounted on a cantilevered arm of a battery-powered pipe-laying machine called a "Tunnelugger," operating on a standard tunnel track. The pipe was supported on a heavy cross-bar engaging holes formed in the wall of the pipe. An hydraulically operated unit at the front end of the arm raised and lowered the pipe to proper transporting position.

Each 14-in. length of sewer pipe was transported to the forward end of the tunnel with its major axis in a horizontal position. At that point it was first rotated 90-deg vertically bringing its major axis vertical; then 90-deg horizontally to match the position of the previously laid pipe. Both rotations were made by hand, by a workman standing in front of the pipe. The section was then adjusted vertically to proper position and the tunnelugger backed up slipping the new section securely into place on the end of the sewer.

There were four sizes of the elliptical pipe, having internal areas equivalent to circular pipe ranging from 30-in. to 48-in. ID.

The 6,940 ft of elliptical pipe was made up of 330 ft of 30-in.; 1,860 ft of 33-in.; 3,650 ft of 42-in.; and 1,100 ft of 48 in.—all equivalent sizes. The 33-in. pipe was installed in solid rock, requiring blasting. The remainder of the sewer was installed in earth, which was excavated by power spades and by hand. One stretch of sewer—830 ft of the 42-in. line—was installed under compressed air.

Seven work shafts were required for the construction of the 6,940 ft of elliptical pipe. One shaft was 70 ft deep, in rock. The others were in earth, extending down to a maximum depth of 47 ft.



AT COVINGTON, KY., a 14-in. length of sewer is lowered by crane and special self-balancing hook (at left) into a 10x10-ft work shaft, then starts through the sewer line (at right) for installation at the heading.

The tunnel excavation in earth was kept only far enough ahead of the line for the installation of one 14-in. section of pipe. Special ½-cu yd muck cars, pulled by the pipe-laying machine, hauled the spoil from the heading to the work shaft, where they were lifted by truck crane and dumped into trucks for haulage to disposal areas. Backfill material of cement and sand was hand packed around every two sections following their installation—similar to that shown in an accompanying photo (page 55) of a sewer installation at Bay City last year.

Each tunnel crew contained five men: a miner, mucker, Tunnelugger operator, crane operator and "top" man at the work shaft. The contractors didn't especially try to establish any tunnelling speeds. The best day's production was 21 ft of 42-in. pipe installation in three 8-hr shifts.

• **Advantages**—Among the advantages claimed for this method of sewer construction is that it requires less earth removal than some ordinary methods. Fewer laborers are needed and less installation equipment is necessary. Since no open excavation is required except at work shafts, there is no interruption of surface traffic when the sewer passes beneath streets. And finally, there is no time wasted setting forms or bracing finished work. This all contributes to faster construction in some instances as well as more economical installations than methods employing open-cut and shoring, or tunneling with liner plate.

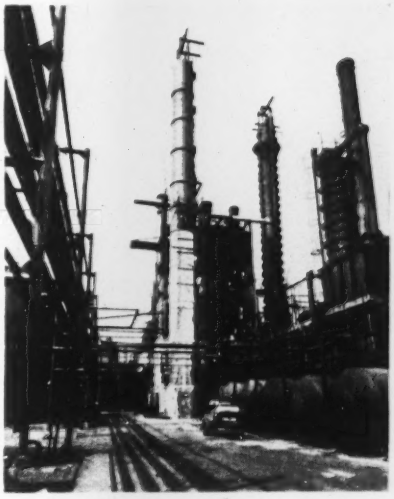
• **Men in charge**—The James McHugh Construction Co. and the S. A. Healy Co., both of Chicago, are the contractors on the project. B. J. Myron is contract manager and Wm. Ragland, tunnel superintendent. Vogt, Ivers, Seaman and Associates, Cincinnati, prepared the designs and are supervising construction. T. S. Danks is their resident engineer. W. D. Anderson is general manager of the sanitation district.

Cleveland talks subways in bond issue plans

Greater Cleveland voters will ballot in November on a $35-million bond issue to finance a subway system in the downtown area. Cuyahoga County commissioners—mindful of possible rising costs—raised the proposal to $35 million from an original $33 million.

The proposed two-track line would be a huge loop, running through the Cleveland Union Terminal, under Superior Avenue, east to Payne Avenue,

HOW FRANKI FOUNDATION COMPANY *Saved $1,000 for Koppers Company*



Chemical Tower at Koppers Company, Tar Products Division, Follansbee, West Virginia.

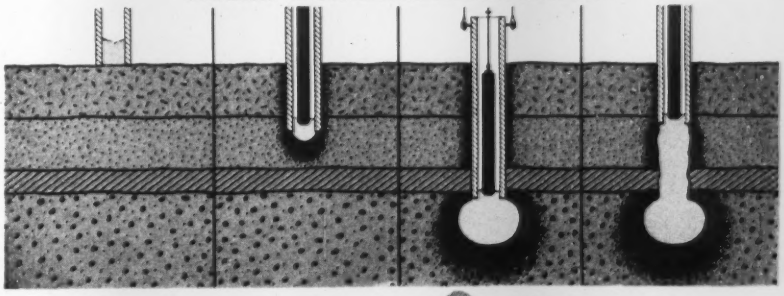
The erection of a chemical tower for the Tar Products Division of the Koppers Company was awarded to Franki Foundation Company. Franki Pressure Injected Spread Footings were reinforced to withstand an uplift force of 5 tons per caisson . . . with 10 caissons employed. The length of each caisson was 40 feet with a working load of 80 tons.

Upon completion of the job, it was determined that Franki had saved the Koppers Company $1,000 in addition to considerable time . . . proof again that Franki Pressure Injected Spread Footings are first for safety and economy.

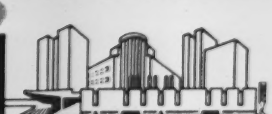
. . . LIGHTEN YOUR COSTS . . . INCREASE YOUR LOAD! . . .

Send for "Franki Facts" for complete information about this Koppers Company project—and an illustrated booklet describing the Franki Foundation method in complete detail. Write Franki Foundation Company, 114 East 40th St., New York.

FRANKI INSTALLATION PROCEDURE



FRANKI
FOUNDATION COMPANY



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south under East 13th Street to Huron Road, thence back to the terminal.

Construction will have a foundation problem, however, according to county engineer Ralph Porter. He commented that the subway might menace downtown structures—many of which stand on heavy mats or spread footings and they will have to be shored and braced.

Under a plan approved by the Cleveland planning commission, 7,800 ft of the tube would be built as a tunnel, in clay, at a depth of 60 ft or more. This method would bring work below a layer of quicksand that is near the surface in much of the downtown area, and is expected to eliminate the need for sheetpiling that would be required in cut-and-cover operations. Escalators would serve stations.

Montreal adds 1000 rooms

Montreal's skyline continues to change. A $20-million, 20-story hotel is ready for an immediate construction start, according to Donald Gordon, Canadian National Railways president.

The 1,000-room structure will be built over the north plaza of the CNR Central Station. This is one more step toward the completion of a long-range development program in the center of the city.

The hotel closely follows the construction of the International Aviation Building, already in use, and will be followed soon, it is claimed, by a 28-story office building.

Municipal briefs . . .

• **TV aids bridge control**—In order to demonstrate one-man control of Chicago's movable bridges, RCA engineers have rigged an experimental 16-mm TV camera to cover "blind spots" on bridges. The camera feeds a 12-in. monitoring receiver in the control house.

• **First major contract**—Cleveland's city board of control has approved a $784,750-contract for the preparation of plans for a $40-million Inner Belt Bridge, the key link in the city's 90-mile freeway system now under construction. Specified are eight lanes on a two-truss viaduct over an abutment-to-abutment span of 2,718 ft.

• **In grass skirts?**—The fame of Denver's "Barnes Dance" system of moving pedestrian traffic is spreading: City supervisors in Honolulu, T. H., have voted to try the system at two downtown intersections.

S. F. housing awards made as funds are cleared

The San Francisco Housing Authority, notified last week that federal funds totaling $13.5 million had been allocated for three local housing projects, has started the wheels rolling by letting the first bid.

Contract winner for the Alemany Housing Project was the Builtwell Construction Co., San Francisco, with a low bid of $1,209,777. Estimated cost was $2,075,000.

Allocation of federal funds also cleared the way for construction of the 608-unit Western Addition, and 350-unit Hunters View projects. But the Harbor Slope and Double Rock projects, which would have housed 226 and 350 families respectively, were dropped.

The Western Addition, for which $8,168,000 has been allocated, will provide living quarters for families who will be forced to vacate present slum dwellings scheduled to be razed under the redevelopment program. The housing project will include six multi-story reinforced concrete buildings. Bids will be called about Nov. 1.

Hunters View will consist of 2- and 3-story frame structures, and is expected to cost $3.3 million. Bids will be early next year.

Two and three-story frame houses will also be built for the Alemany project, which will provide 164 living units. Work is expected to start within 60 days, with completion scheduled for next summer.

All six bids for the project fell more than $500,000 short of the estimate.

Two N.Y.C. projects planned-housing for 4056 families

Two adjoining redevelopment plans that will result in a face-lifting for a portion of New York's Greenwich Village and provide living facilities for 4,056 families were announced recently by Robert Moses, chairman of the Mayor's Committee on Slum Clearance, and N. Y. State Housing Commissioner Herman T. Stichman.

Under the plan one tract of nine blocks will be transformed into three super blocks with the elimination of two streets. Nine 14-story apartment houses will be constructed to house 2,184 families.

The second main tract also will be consolidated through the elimination of streets to provide space for eight low-rent apartment buildings for 1,440 families. In a secondary tract the housing authority plans two structures which will take care of 432 families.

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TWA twin hangars, Chicago, each 270 feet long, with clear span of 270 feet and center height of 65 feet. Five arch ribs were poured monolithically with shell over prefabricated falsework furnished by Timber Structures, Inc. Each hangar was completed in two sections, with falsework being lowered and moved intact into position for pouring the next section. Hangar was designed by Ammann & Whitney, engineers; W. E. O'Neil Construction Co., Chicago, was general contractor.

Save Time and Money with Prefabricated Falsework

This roof arch form is Timber Structures' answer to the need for sturdy, precision built falsework that is thoroughly engineered, quickly assembled and easily moved for repetitive use. It required only two hours to move the assembly into position for the second pour, and only half a day to move it intact into the adjoining hangar. ...Let us show you how similar falsework will speed your work and increase profits on your next job. See your nearest Timber Structures office, or write for information.

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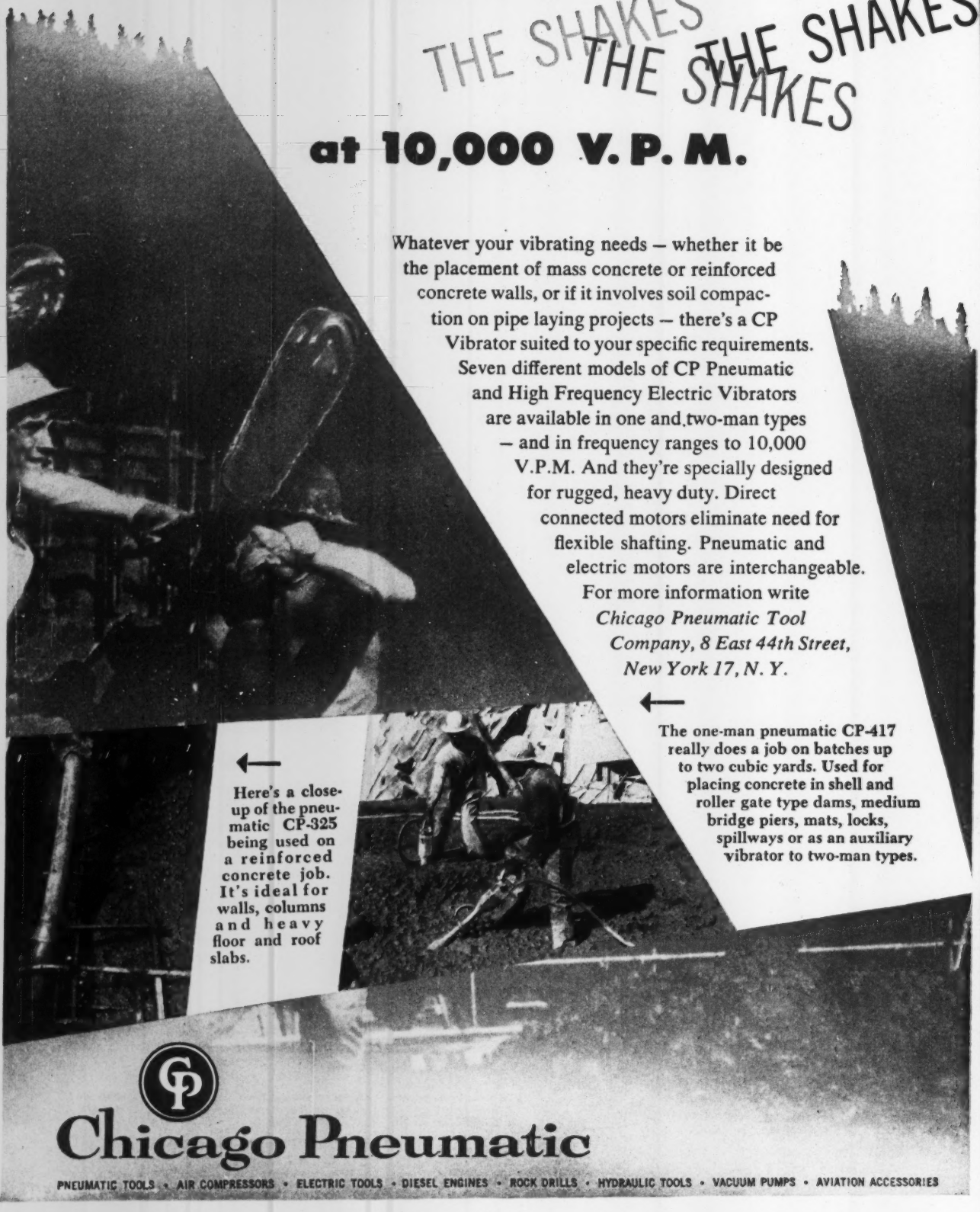

Whatever your vibrating needs – whether it be the placement of mass concrete or reinforced concrete walls, or if it involves soil compaction on pipe laying projects – there's a CP Vibrator suited to your specific requirements. Seven different models of CP Pneumatic and High Frequency Electric Vibrators are available in one and two-man types – and in frequency ranges to 10,000 V.P.M. And they're specially designed for rugged, heavy duty. Direct connected motors eliminate need for flexible shafting. Pneumatic and electric motors are interchangeable. For more information write *Chicago Pneumatic Tool Company, 8 East 44th Street, New York 17, N. Y.*

← Here's a close-up of the pneumatic CP-325 being used on a reinforced concrete job. It's ideal for walls, columns and heavy floor and roof slabs.

← The one-man pneumatic CP-417 really does a job on batches up to two cubic yards. Used for placing concrete in shell and roller gate type dams, medium bridge piers, mats, locks, spillways or as an auxiliary vibrator to two-man types.

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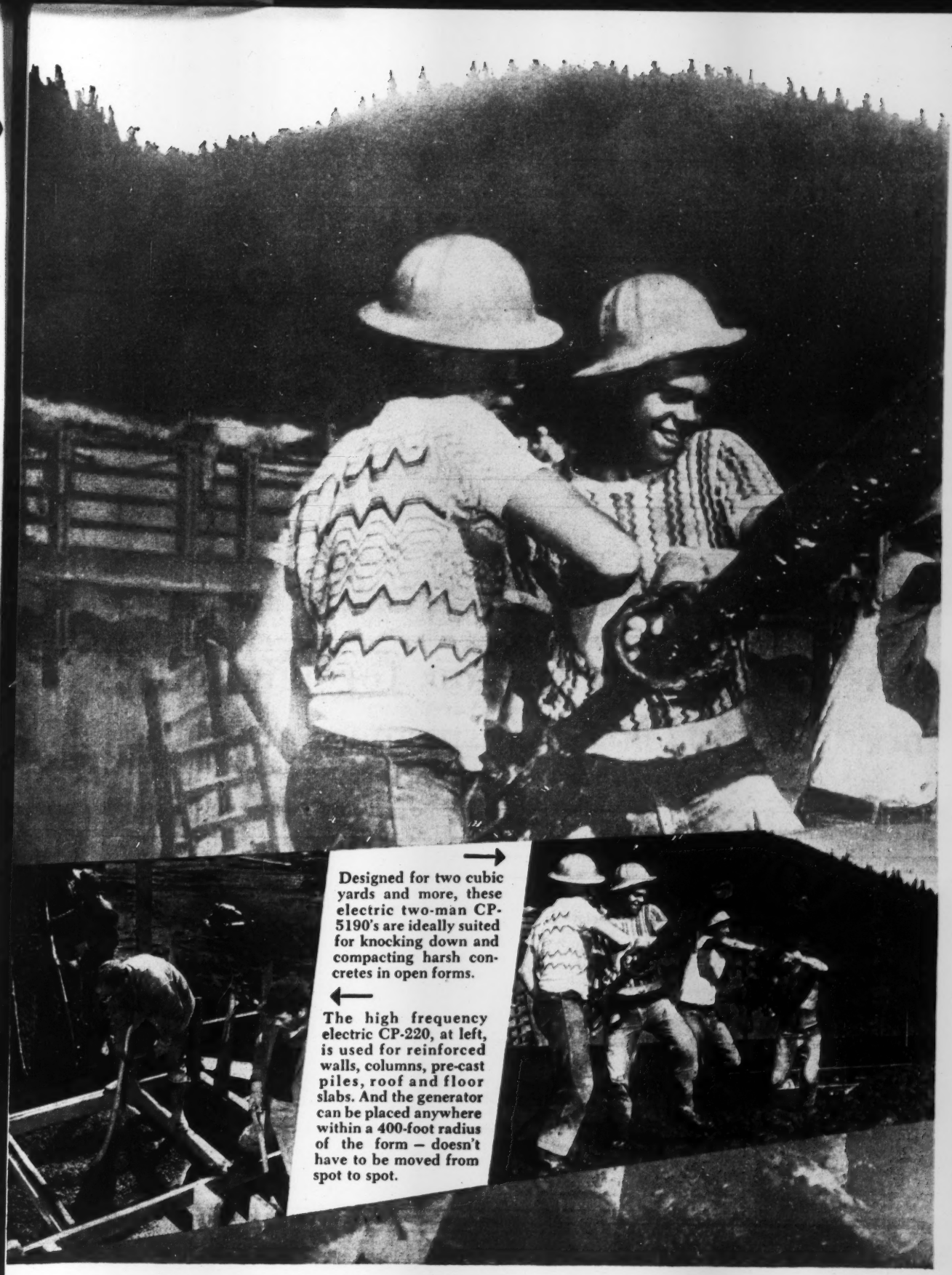

→ Designed for two cubic yards and more, these electric two-man CP-5190's are ideally suited for knocking down and compacting harsh concretes in open forms.

← The high frequency electric CP-220, at left, is used for reinforced walls, columns, pre-cast piles, roof and floor slabs. And the generator can be placed anywhere within a 400-foot radius of the form – doesn't have to be moved from spot to spot.

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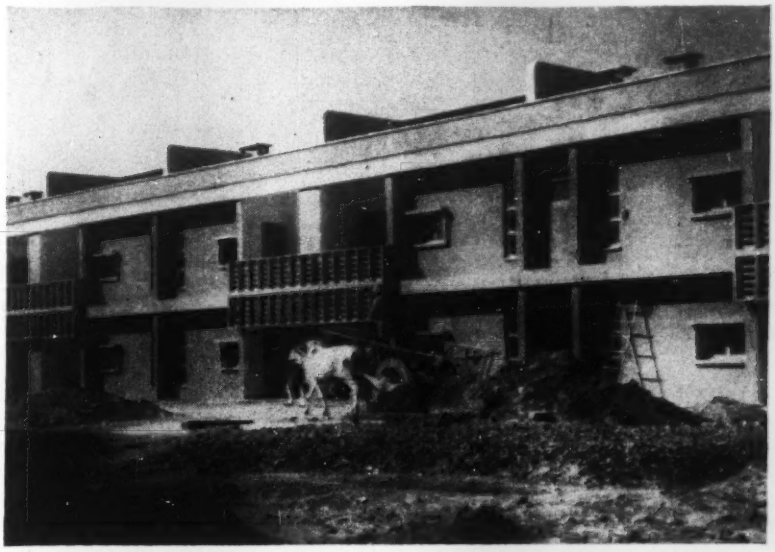
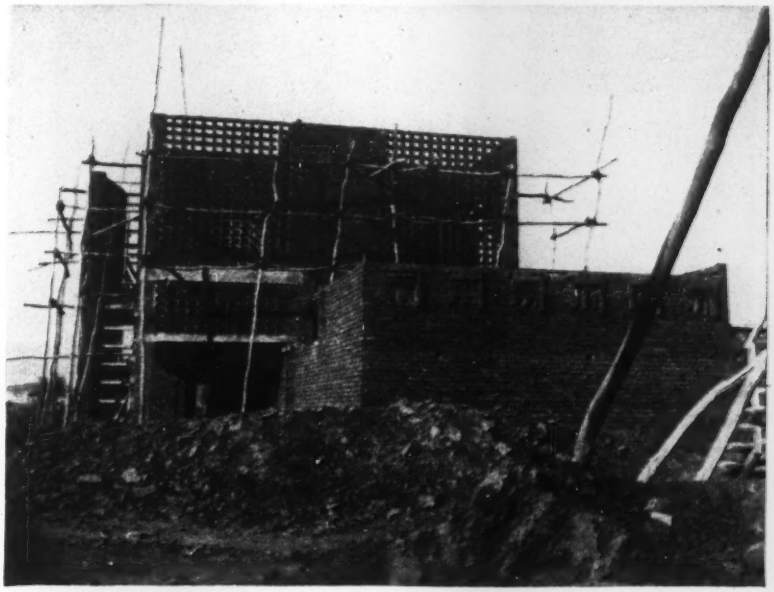


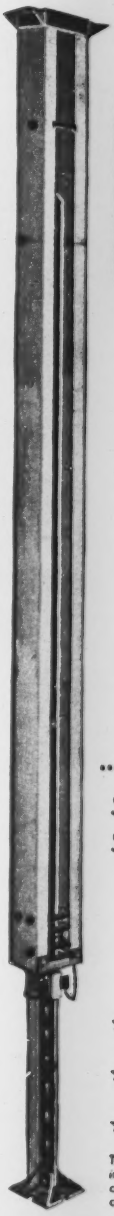
APARTMENTS for middle income group feature balconies since in the Punjab people sleep out of doors eight months of the year.

East Punjab starts from scratch to build new capital city

A new capital city is rising from the Indian plain in the East Punjab. After the partition of India in 1947, the old capital of East Punjab, Lahore, went to Pakistan, and the province set up a temporary capital in the Himalayan foothills at Simla. In 1950 the provincial government chose Chandigarh at the foot of the Shevalik Hills for the new permanent capital. Work on the project has progressed far enough so that all governmental de-



OPEN BRICK TRELLIS is used to protect verandas and windows from the sun and rain while allowing for the free passage of air. Note scaffolding.



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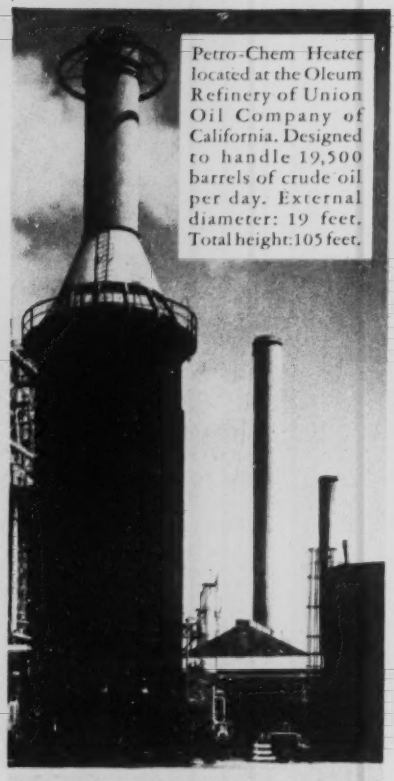
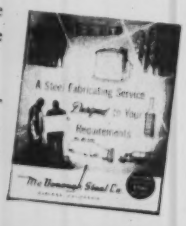


Petro-Chem Heater located at the Oleum Refinery of Union Oil Company of California. Designed to handle 19,500 barrels of crude oil per day. External diameter: 19 feet. Total height: 105 feet.

Engineering in Steel

Here is another completed job now in the extensive photo files of McDonough Steel Company. In these files can be found pictures of steel fabricating work for practically every field in Industry—Food Processing, Chemical, Construction and many more. There's the general steel fabricated plate work of stacks, breaching, ducts, hoppers and bins as well as the special, exacting job which requires sound engineering and complete manufacturing facilities. Whatever your needs—large or small—we would like to show you more of the products we have manufactured.

Send today for our new pictorial booklet. There's no obligation.



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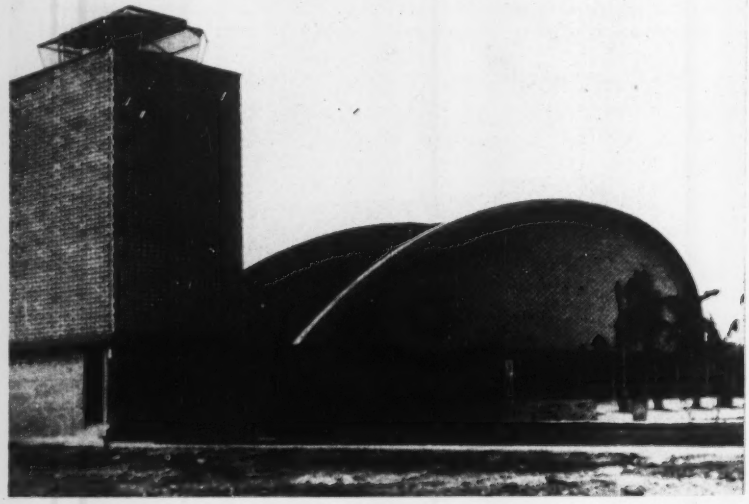
FREE-STANDING SUN SHADES protect the walls and windows of this administrative building from the intense summer glare.

partments, in partial strength, will move down to the new site in October of this year. The new capital will be occupied fully by the winter of 1954-55.

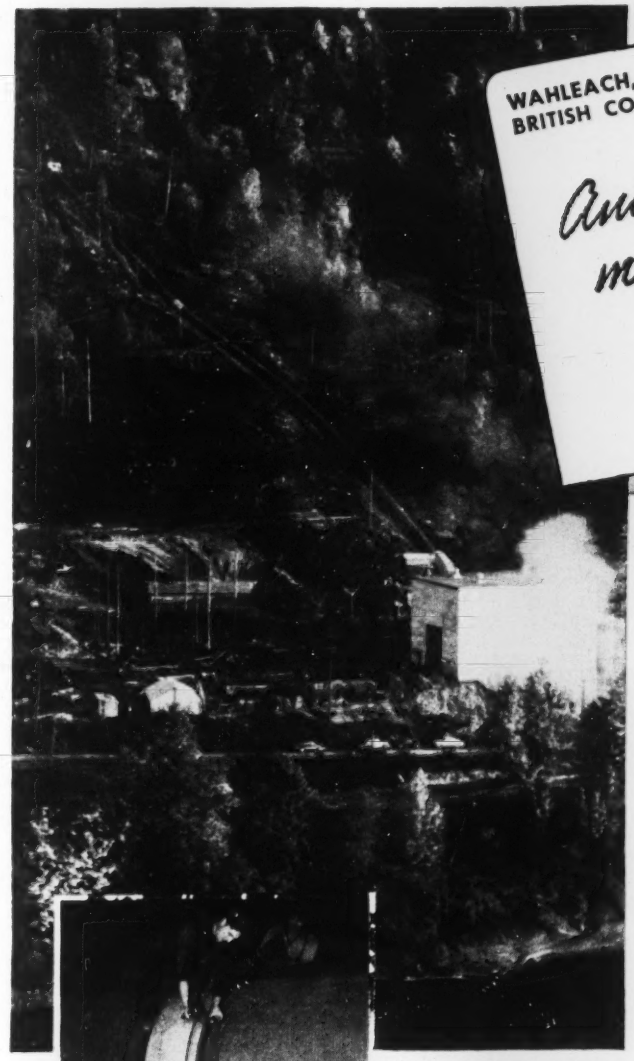
During the first phase in the construction of Chandigarh, the capital will house 150,000 people.—Ultimately there will be a population of half a million. The $35-million project is being built of brick, stone, and some reinforced concrete. The new city will have 35 educational institutions ranging from nursery schools to colleges and technical institutes, 9 health and medical centers, a public library, museum, art gallery and art school, 6 community centers with swimming pools, a stadium, municipal offices and administrative buildings.



NEW AIRPORT TERMINAL for the Mexican resort center of Acapulco features open walls made of three-celled concrete blocks laid on their sides for a maximum of natural ventilation. The arched roof of the main building—actually in the shape of one-half of a tear-drop—is a thin-shell reinforced concrete slab placed between two arched concrete ribs. The building's walls allow the slightest breeze in the hot climate to blow right through the structure. Tropical rains usually fall straight down, but during occasional storms, rain simply blows in through the walls and equipment that might be damaged by rain is covered.

WAHLEACH, BRITISH COLUMBIA

Another Penstock job made easier with DRESSER COUPLINGS



Above—Overbends made by 1° deflections at each field joint eliminated shop-made bends and special anchors.

Left—Four men averaged less than four hours making bottle-tight joint . . . 975 psi working pressure, 1500 psi shop test on couplings.

Project designed by B.C. International Engineering Co., Ltd.
Penstock installation by Arrow Transfer Co., Vancouver

Lighter, high-yield steel pipe cuts tonnage, shipping, installation costs . . . speeds completion of 1760-foot Wahleach penstock.

Six weeks after construction began, this 70″ penstock—the fourth Dresser-Coupled installation made by the B. C. Electric Company—was ready to deliver water to a 75,000-kva power plant near Vancouver, British Columbia.

Eliminating extensive excavation, resilient gaskets in Dresser Couplings allowed the penstock to be deflected to the natural contour of the right of way. The lighter weight and longer lengths of high-yield steel pipe meant easier handling, fewer joints and anchors. A field crew of 20 men—with a minimum of skill, supervision and heavy equipment—*Dresser-Coupled 1,000 tons of steel penstock in 21 working days.* Under test, the line proved absolutely bottle-tight.

Dresser Couplings permitted faster completion of the line and assured permanently tight, maintenance-free joints. This resulted in *earlier revenue* from plant operation . . . *uninterrupted service* to power consumers.

BE SURE you get a *better, faster* penstock installation. Put high-yield steel pipe and Dresser Couplings in *your* specifications.

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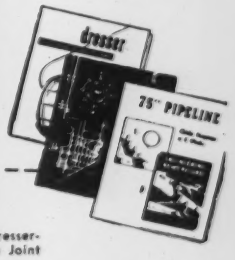

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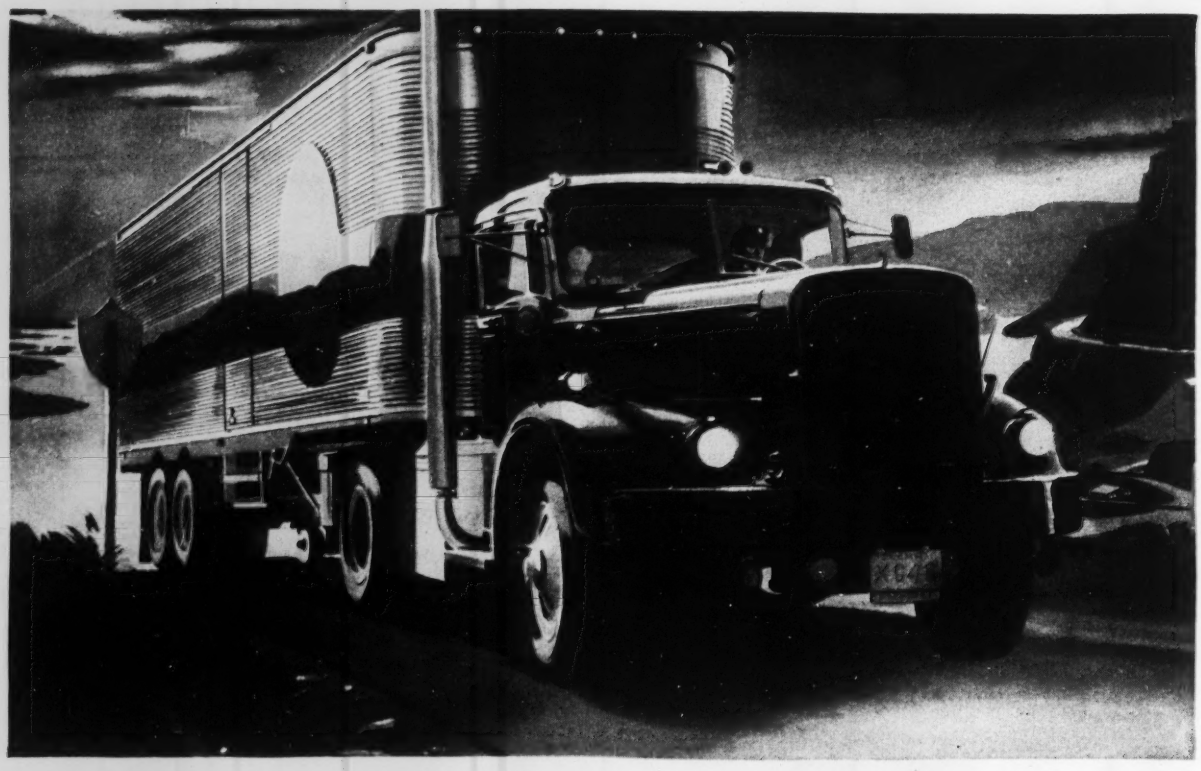


For the long haul... Autocar relies on RB&W bolts

Famous truck builder rates them best for ease of assembly and accessibility

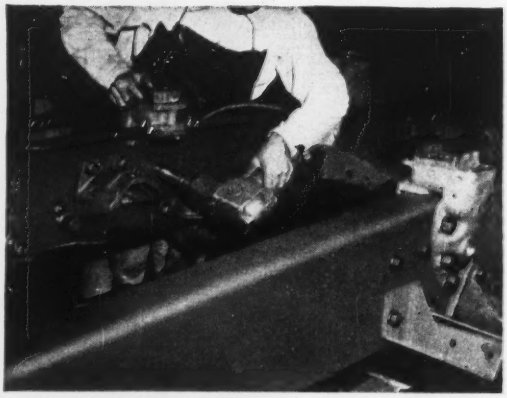
It's been a long time since the Autocar people switched from riveted to bolt-and-nut construction. Here's how it happened:

Two Autocar engineers took off on a coast-to-coast run to shake the bugs out of a new test model. Things went well until a riveted spring bracket broke. It took an entire day just to chisel through the rivets because it was hard to get at the bracket.

From that day on, it was *accessible* bolt-and-nut construction exclusively for all Autocar trucks. And Autocar standardized on RB&W bolts. One dividend from using these rugged bolts is that Autocar can specify higher-strength material than is practical for riveting. Furthermore, tests on structures like bridges show that rivets frequently loosen. This doesn't happen to bolts on Autocar frames.

Where you want to join structural members firmly together so they'll *stay* together for good, high-strength bolting is often your best bet.

As the leading manufacturer of all kinds of fasteners, we're in the unusual position of always being able to recommend and supply the right ones for all your needs. Write to RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY, Port Chester, N. Y.



FASTER FASTENING is achieved in the Autocar plant at Ardmore, Pa., by using air tools like the one shown here to run up RB&W nuts on RB&W bolts on an Autocar truck frame. In addition to making tight, accessible joints, bolting effects substantial assembly savings. 3.1

RB&W

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Apartment construction in Chandigarh is planned to accomodate widely differing income groups. Houses for officials earning about $450 a month to small apartments for office boys earning less than $20 a month are representative of the range of residential building.

The open brick trellis-work—placed around porches and windows for protection from the elements—throughout the city is a modern adaptation of the carved stone screens of the Mogul architecture of Northern India. There is, however, some dissension among a few inhabitants about one aspect of the overall architecture: the long low lines of some buildings now going up do not meet with the approval of many people who are used to the domes and cupolas of Hindu architecture.

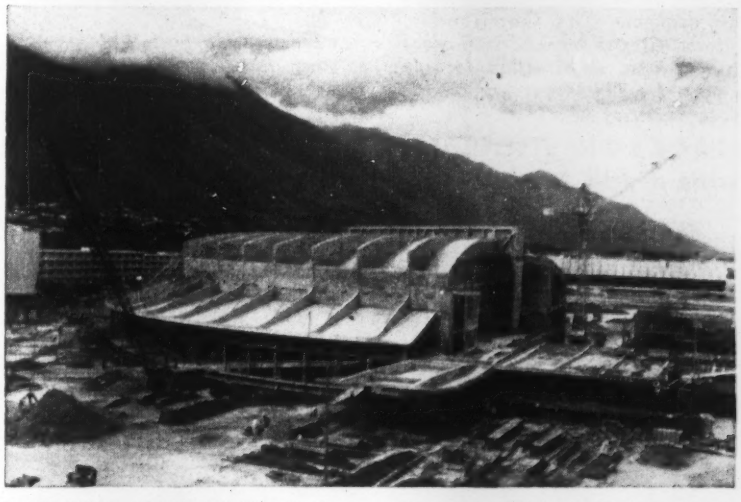
Architects for Chandigarh's master plan are Mayor and Whittlesey of New York, Le Courbusier and Jeanneret of France, and Fry and Drew of England.

International briefs . . .

• **Hospital for San Salvador**—The El Salvador Ministry of Public Health plans to construct a $7.2-million medical center from plans prepared by the IBEC Housing Corp., a unit of the International Basic Economy Corp., New York. The ministry has announced that the plans will be processed for bidding by foreign construction companies, and that invitations for bids will be issued soon. The project outline allows five years for completion of the work.

• **Israel lake drained**—Lake Huleh in northern Israel near the headwaters of the Jordan River is being drained into the Jordan by the Construction Aggregates Corp., of Chicago. The project will reclaim from the broad, shallow lake 4,000 acres of new farm land and 5,000 acres of improved land. An estimated 4,000,000 tons of peat lie in the lake bottom and Israeli scientists calculate that the peat could be used as a fuel to run a 10,000-kw thermal power plant for several decades.

• **Loan to Brazil**—Development of a wide area of the state of Minas Gerais, Brazil, is made possible by a new $7.3-million loan from the World Bank to a state-controlled hydroelectric company. The loan will be used for the erection of two 12,000-kw generators, 80 miles of transmission lines and a number of substations. Full operation is expected in 1956. President Getulio Vargas of Brazil pointed out the following facts last month concerning that country's supply of electricity. Brazil's power supply is 1,000,000 kw under national demand; in the next five years this figure will



CONCRETE AUDITORIUM in Caracas, Venezuela, will be finished in time to seat 3,500 people convening for the 10th Pan American Conference in March of next year. Called the "Aula Magna," the auditorium, after the conference, will become part of the University of Caracas. The structure is of reinforced concrete girder construction with a thin-shell roof slab and incorporates TV, radio, and interpretation facilities along with air conditioning, library, roof garden, and restaurant.

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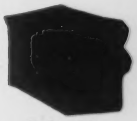
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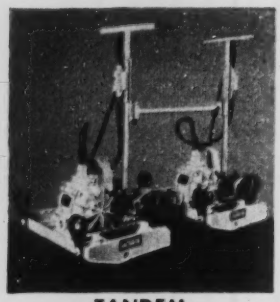
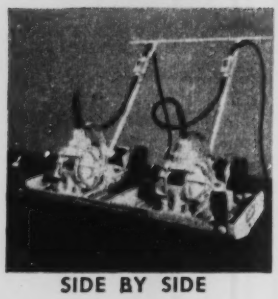


TANDEM



SIDE BY SIDE

The Jackson Vibratory Compactor, which has proved so exceedingly effective in blacktop pavement widening and patching, paving walks, drives, railway platforms and street crossings, as well as compacting granular soils and crushed rock in sub-bases, bridge approaches etc., is now available in TWIN-UNITS . . . for side-by-side or tandem operation. With either of these twin-unit hook-ups, since they are self-propelling, one operator, in most applications, can readily accomplish twice as much as with a single unit — thus speeding progress and halving labor costs. Compacting upwards of 4,000 sq. ft. per hour of bituminous mix close to maximum density is not at all uncommon. For maximum mobility and time-saving convenience an auto trailer with quick pick-up of the twin-unit and mounting a power plant of more than ample capacity, is also available. The Compactor, either single or twin-unit, can be used with great effectiveness in macadam construction for the odd work not done by the larger equipment. Get the complete facts, at once.

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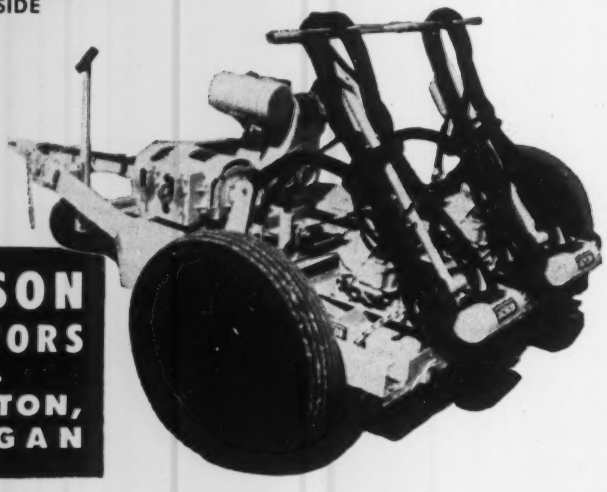

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INTERNATIONAL

increase to 2,900,000 kw. Taking the present 10% normal increase in demand yearly, new installations producing 5,900,000 kw will be needed. The total investment necessary to cover the shortage would be $665 million in five years, and $1.36 billion in ten years.

• **New Zealand steam**—Government engineers in New Zealand are using oil well drilling equipment to tap sources of live steam of volcanic origin underground on the North Island. The plan is to bring the steam to the surface in quantities sufficient to operate turbo-generators for the production of electrical energy. The ace in the hole, however, is the possibility that the steam may also be useful in the production of "heavy water", (deuterium oxide) which is used in the operation of atomic reactors and sells for as high as $200,000 per ton. Exploratory drilling has delivered 8000 lb of 94% dry steam per hour.

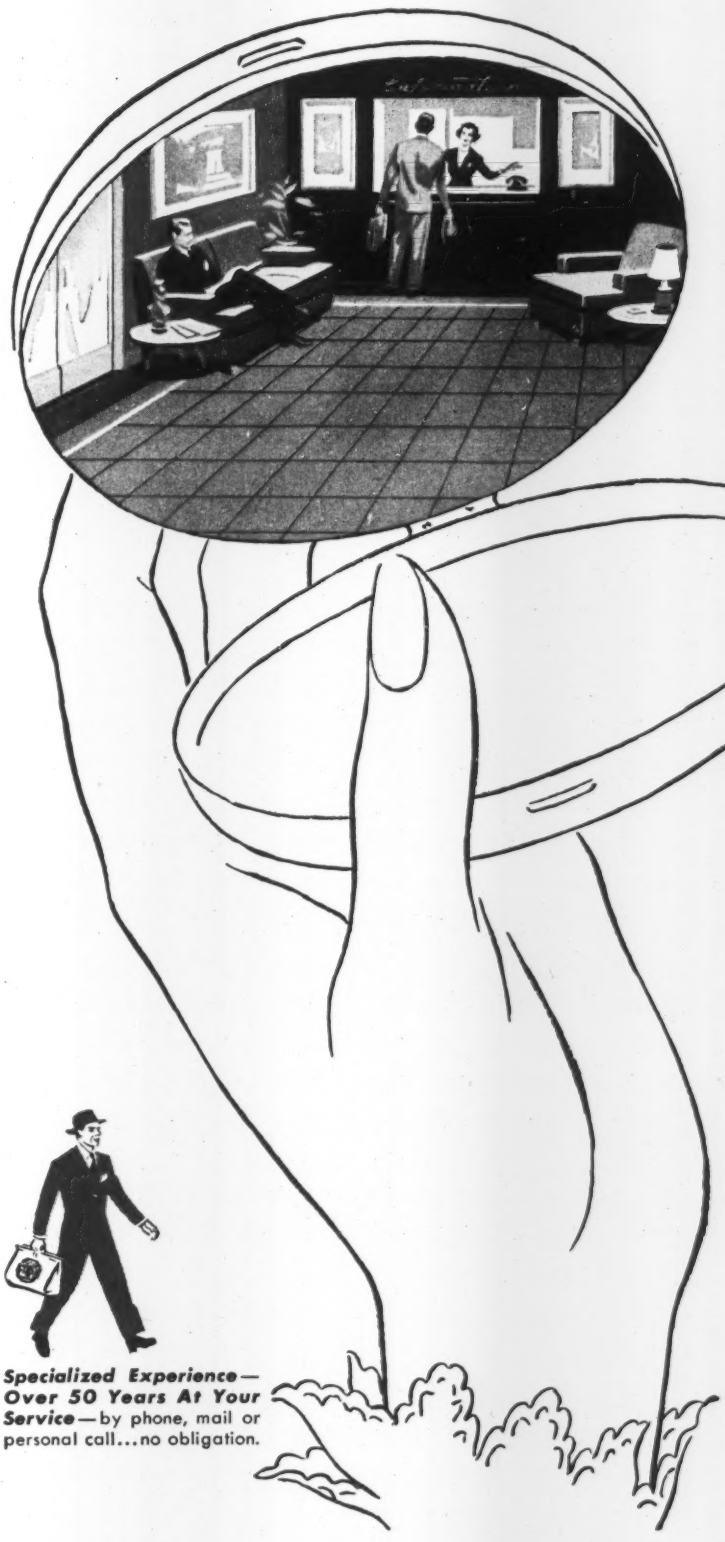
• **Philippine contracts**—Ambuklao Dam contracts amounting to $2.5-million for electrical equipment have been awarded by the Philippine National Power Corp. to General Electric Co., Westinghouse International Development Corp., and the French firm of Electriques et Mechaniques. GE will supply six transformers and three generators in its contract, Westinghouse two transformers, and the French firm will supply synchronous condensers and accessories.

• **Guatemalan port**—The Guatemalan government has awarded Morrison-Knudsen Construction Company, Boise, Idaho, the contract for a new seaport at Santo Tomas on the Caribbean coast. The completely new port, including deck and warehouse facilities is to be constructed at an estimated cost of $5 million.

• **Mexican, Canadian plants**—Plans to build new manufacturing plants in Canada and Mexico have been announced by the Electric Auto-Lite Co., New York. The plants, to be constructed at Calgary, Alta., Canada, and near Mexico City, are part of Auto-Lite's $10-million capital additions program which has been announced for 1953.

• **Colombian Airport**—Porter, Urquhart & Beavin, consulting engineers, Newark, N. J., have been retained by the city of Medellin, Colombia, to study and furnish a report on the proposed expansion of its municipal airport.

Is the **value** of your floors only **skin deep?**



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They're made by Flintkote. You simply mix and apply by trowel over any firm base in thin or thick section.

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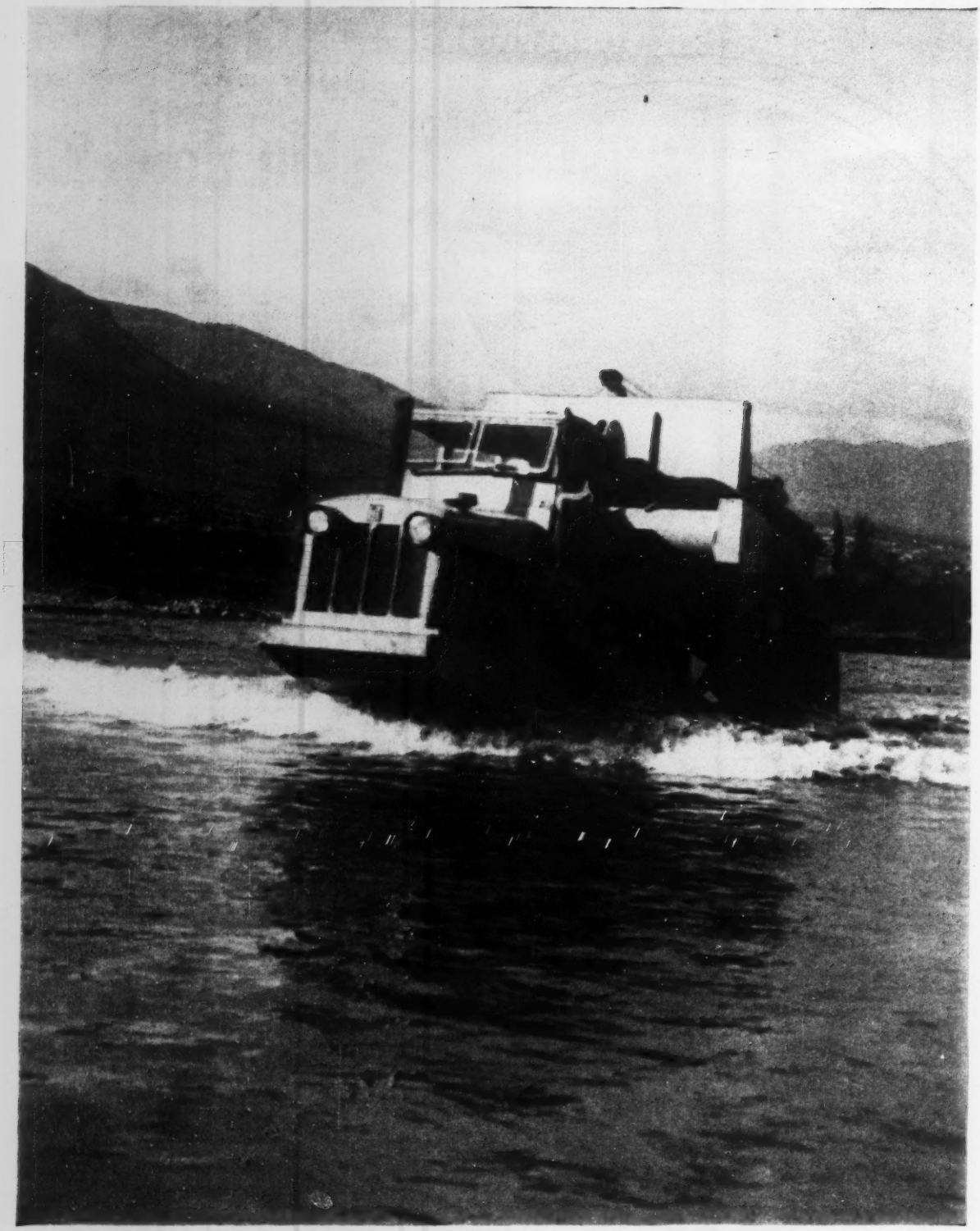
Pictures of the month . . . *by LeTourneau-Westinghouse*



DRIVES THROUGH RIVER — In Colombia, Tournarocker brings gravel and sand from river-bed to the new public stadium being built in the city of Medellin. River bottom is rough and full of rocks and holes. Water depths range from 20 to 30 inches, but Tournarocker disc-type air brakes and electric control system have not been harmed, or even affected, in a year of this work. Underwater loading was necessary because the river-bed was the only nearby source of material for concrete.

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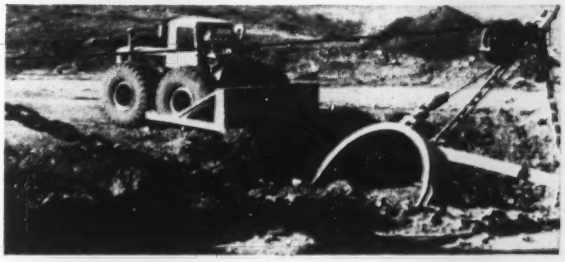
. . . with performance reports from around the world



WORKS IN ABRASIVE MATERIAL —Westmoreland Manganese Corp, Batesville, Arkansas, works their Tournatractor in material so abrasive that dragline teeth must be replaced every 8 hrs. This set of tires, retreaded once, still has 45% of tread left after over 1000 hrs of use. Unit cleans clay and flint rock from around 2½-yd shovel and 5-yd dragline.

PLOWS SNOW AT HIGH SPEED — In addition to moving dirt, D Tournapull can be equipped with a V-Plow and rented out in winter for clearing snow. The machine shown here was used all last winter by Crawford County, Iowa. With a top speed of 28 mph it makes an ideal plow for fast cleanup on farm-to-market and access roads.

25 TRIPS ON 1050 FT CYCLE — On Indianapolis grading job, D Tournapull self-loads 4½ pay yards of scarified dirt and gravel in 35 seconds. Complete 1050 ft cycle takes about 2 minutes. In a 50-min hour, unit moves 25 loads. "An excellent volume of work," says Owner Robert Horth. "The 7-yd 'D' is a very versatile, very handy tool."

153 YDS OF MUD HOURLY — "At the time this picture was taken," writes R. M. Enebak, Faribault, Minnesota contractor, "we were working a series of balances on our 8.4-mile, 442,000-yd road grading job between Faribault and Morristown. The dirt was a very heavy clay, well soaked by 22 days of rain. The going was extremely tough. We used our 3 C Tournapulls with 2 push-tractors on this stretch and our records show an average production for each haul unit of 153 yards per hour. Haul was 400 ft one-way. We are very well satisfied with Tournapull performance. We like their ability to operate in tight places on short hauls, and their speed on long hauls. We also like the fact that moving from job to job is no problem."

(Continued on next page)

(Advertisement)

Pictures of the month . . . by LeTourneau-Westinghouse

STRIPS 200 FT OF SHALE to reach 30 ft seam of coal. This open-pit provides the country of Malaya with its only source of coal. The miners are working 18 LeTourneau haulers 21 hours a day, 7 days a week. Each hauls 18 tons of overburden per load. They averaged 15 mph over narrow, hilly, winding haul roads. Units on one-mile cycles deliver 9 to 10 loads per 50-minute hour.

"GENERAL HANDYMAN" — That's how Jones & Hezlep, Denver, Colorado, describe the D Tournapull they use for sewer clean-up and other city jobs. Here, the 7-yd. "D" helps on trench excavation . . . makes a 300-ft cycle every minute. Unit also hauls excess dirt away from trenches, backfills, builds roads, alleys. Drive tires, recapped after 3 seasons (5000 hrs), are expected to last at least one more season before needing replacement.

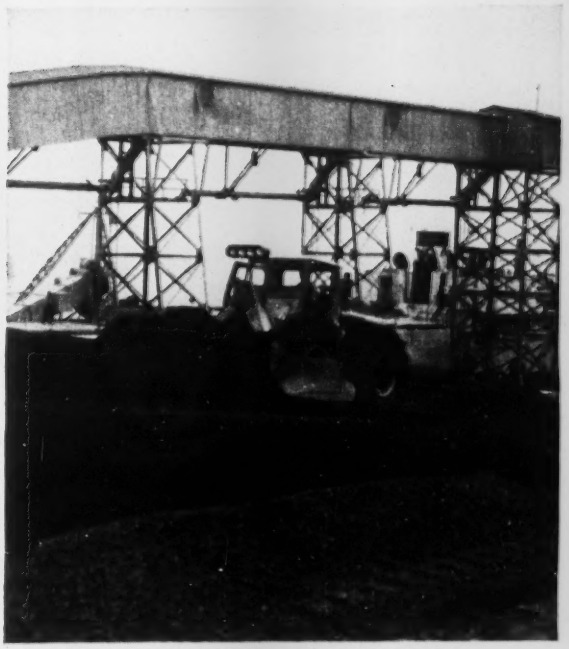
GOES ANYWHERE — For moving over mud and lifting out of tight quarters, Tournacrane prime-mover can be turned at right angles to crane for extra stability and greater reach. Big tires and constant-pull differential keep unit rolling through muck. Tournacrane here is lifting wall sections for a new church.

THRU BY '54 — With completion of the 430-mile New York Thruway slated for Sept, 1954, contractors are using fastest methods possible to meet contract dates. On their section south of Rochester, Arute Bros, New Britain, Conn, find this 19 mph Tournatractor ideal for high-speed shaping of roadbed and other dozing jobs.

. . . with performance reports from around the world

2.2-MILE CYCLE IN 14 MIN — Open top and wide bowl make dragline loading of these C Tournapulls easy. Units also move scraper dirt . . . 4 loads, 48 pay yds, hourly per machine on 2.2-mile cycles. Job consisted of grading a power plant site near Danville, Illinois, by R. A. Cullinan and Son of Tremont.

STUMPS, LEVELS, PLOWS — Gene Dyer, West Palm Beach (Fla) rancher, stumps, clears, levels, plows 4,500 of his 27,000 acres annually. His Tournatractor does all of it . . . also builds dikes, ditches, and 8 to 10 miles of new road per year. Says Dyer, "Tournatractor gets around 3 times as fast as the 91 hp crawler-tractor it replaced." It rips out 60 cut-over pine stumps hourly.



DOES WORK OF 2 CRAWLERS — A large Canadian cement company replaced two 148 hp track-type tractors with a Tournatractor on coal stockpiling in Ontario. 19 mph Tournatractor moves as much coal on 900-ft cycles as both crawlers combined . . . still has 10 to 15% of its time available for such "bonus jobs" as building, maintaining roads, removing snow, cleaning pit.

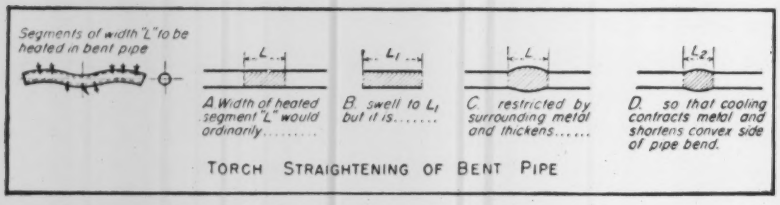
NO JACKKNIFING — Power steer through geared king-pin holds prime-mover and scraper in fixed position as C Tournapull backs easily onto soft fill at end of 7600-ft haul. Unit is one of a fleet used by J. H. Beckman Construction Company, Sioux Falls, South Dakota, to move 200,000 yds for construction of coffer dams and 2 earthfill ramps for parallel bridges across the Missouri River at Chamberlain. Work was made necessary by completion of Fort Randall Dam which will raise the water level 40 ft. Bridge in background will be moved 600 ft to the ramps to carry west-bound traffic. A second bridge is to be moved in to handle east-bound traffic.

Tournapull, Tournarocker, Tournacrane—Trademark Reg. U.S. Pat. Off., Tournatractor—Trademark Pic-492-G

WOOD SCREED attached to excavator assists concrete placement for centerstrip street paving project. Hot-mix goes on top of concrete.

Job-made power screed speeds work

A simple beam attachment made a hydraulic excavator into a concrete-screeding machine on a street paving job. The assignment was to pave a 16-ft wide center strip 4,900 ft long with 8 in. of concrete base and 2½ in. of asphaltic concrete. The beam screed had notched overhangs at each end so it could ride on the adjacent surface, maintaining the 2½-in. depressed grade to receive the hot-mix. Made of wood, the screed was devised by E. C. Behrend, superintendent for the contractor, Schloss Paving Co., of Cleveland.


Segments of width "L" to be heated in bent pipe
A Width of heated segment "L" would ordinarily.....
B. swell to L1 but it is.....
C. restricted by surrounding metal and thickens.....
D. so that cooling contracts metal and shortens convex side of pipe bend.

TORCH STRAIGHTENING OF BENT PIPE

Straightening metal pipe

Metal pipe, particularly large diameter pipe, can be straightened neatly and adequately for even the most particular use by heating with a torch small segments of the pipe on the convexity of a bend.

In the illustration, the small segments of width *L* are heated very rapidly up to a light yellow heat. This heated segment is not free to expand because it is surrounded by cold solid metal, and as a result it takes on a thickened shape (exaggerated in the illustration), which retains its relative shape as it cools.

The cooling process shrinks the segment and the cold metal on either side of the segment is drawn in slightly, thereby shortening the length of the convex side of the bend in the pipe.

Enough applications of this method on any bend can straighten the pipe to the desired trueness. More rapid straightening action may be had by quenching the heated segments of metal, but if it is undesirable to have any hardening or undue stressing in the metal pipe, the segments may cool at ordinary temperatures. G. KUYT, TRAIL, B. C., CANADA.

Soil samples frozen

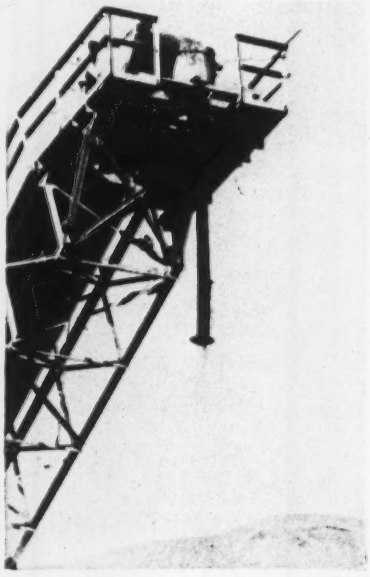
The Oklahoma State Highway Department recently used dry ice in soil studies for a bridge. The object was to get satisfactory samples of material below the water table at a proposed crossing of the South Canadian River near Norman, Okla., and thereby to determine how much of the crossing could be built as an earth fill.

To take samples, workmen sank casing into the riverbed below the water table, then ran a smaller tube down inside the larger one. The sand and water between the two tubes was pumped out and replaced with dry ice. The ice froze the aqueous mixture inside the smaller tube, allowing it to be brought to the surface for analysis.

Chute lays dust nuisance

When material, conveyed from crusher at a Kingston, N. J., aggregate plant, blighted the neighborhood with wind-blown dust, operators developed a telescoping chute that would minimize the nuisance. First chute was made of metal, but abrasion from crusher-run quickly wore it out.

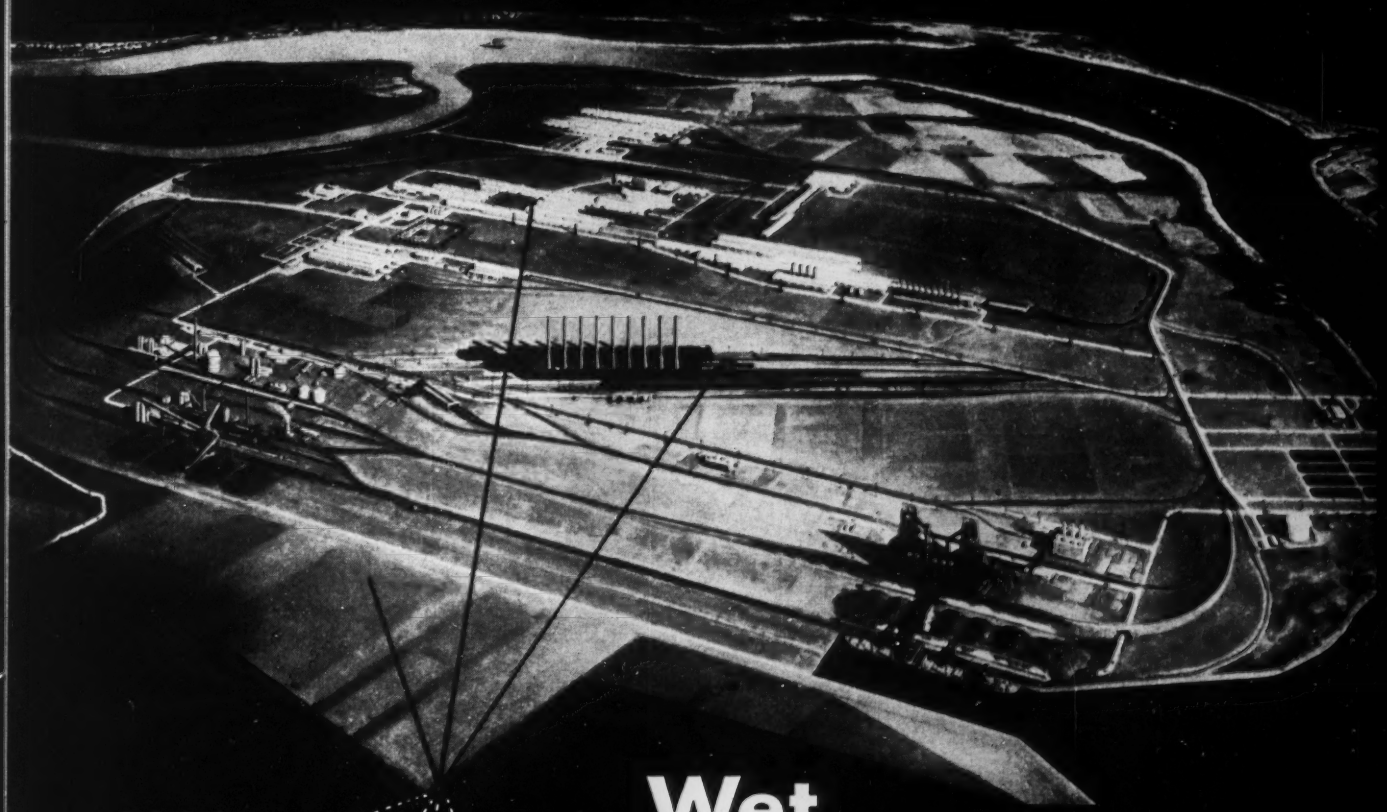
The successful chute is made of two lengths of wire-reinforced rubber hose, similar to suction dredge hose. The inner section, 25 ft long, is attached to the conveyor discharge point; it is 7½ in. OD. A 20-ft section fits around the first one; at its lower end there is a flange, to which a hoist line is attached. A small winch above controls the outlet position, permitting it to be just above the pile so winds don't have much chance to blow fines as they drop.



Thermoid photo

RUGGED RUBBER HOSE telescopes so it can put crusher-run right on pile.

Fairless Works on the Delaware River —
Foundation, Grading and Dredging Contractor:
Walsh-Perini-Groves-Slattery
Companies, Morrisville, Pa.



Wet

3900 acres, most of it

Pumping was Problem #1 when it came to turning the farmlands of Morrisville, Pa. into the Fairless Works for United States Steel Corporation.

Moretrench Wellpoint Systems — by the mile — expertly planned, expertly installed, soon had the water under control. Excavation for coke ovens, power plant, blast furnaces, slip areas and other foundations went ahead on the double — IN THE DRY!

Twenty months later this enormous steel plant began production — a magnificent testimonial to the teamwork of the construction industry. From brains to brawn, Moretrench salutes every member of that team!

Moretrench Corporation

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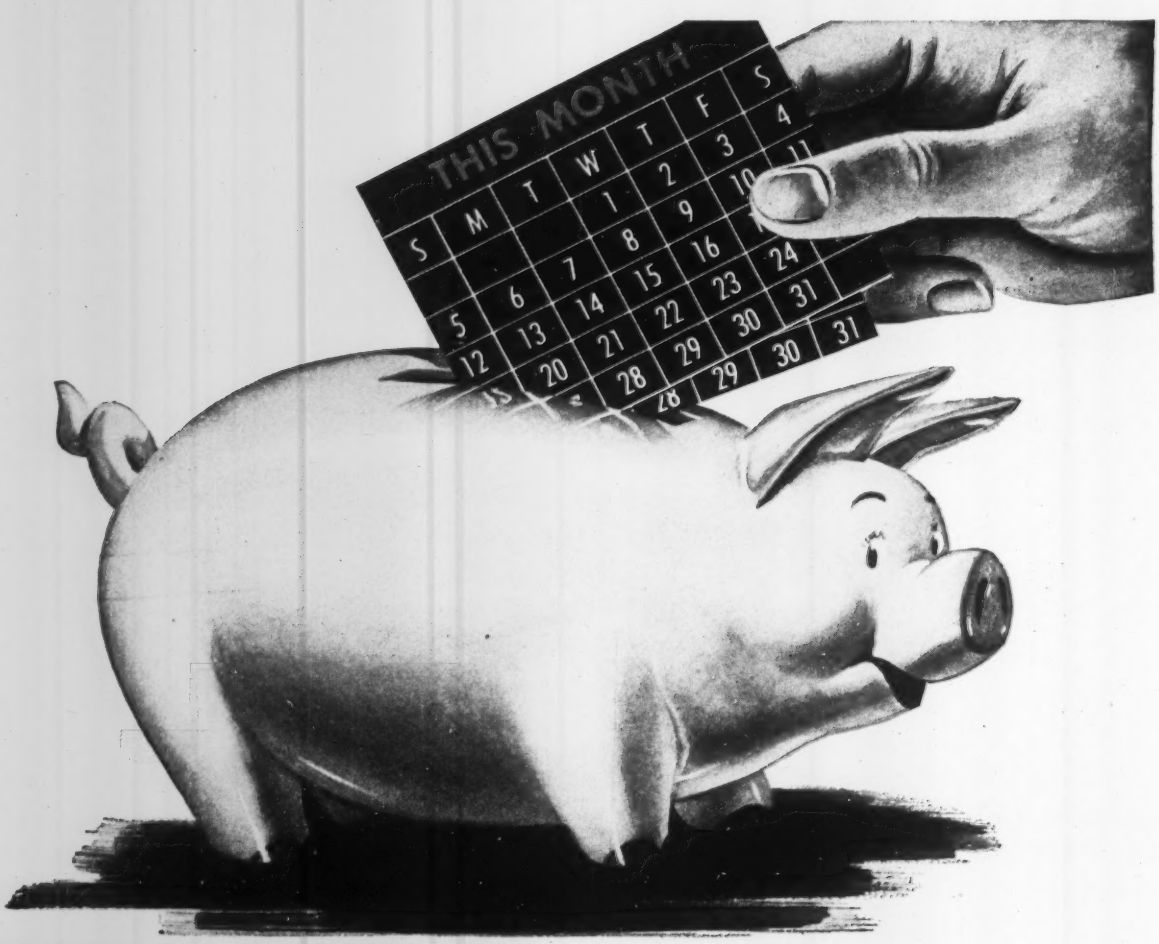


SAVE TIME... only one week needed for new SOIL-CEMENT testing procedures

New short-cut procedures for determining the cement factor in soil-cement construction in sandy soils have been devised by the Portland Cement Association. They save five of the six weeks formerly needed for tests.

The 2,229 sandy soils from the U.S. and Canada previously tested according to standard ASTM-AASHO procedures were analyzed. This analysis showed a correlation between cement factor requirements and (1) maximum density, (2) combined silt-clay content and (3) compressive strength.

Based on these relationships the new procedures provide reliable methods for determining safe cement factors in one week for most sandy soils. In one day one laboratory man can perform all tests needed for most samples except the one for compressive strength. That takes seven days. And much smaller soil samples suffice, too—usually from 60% to 75% less than was formerly required.

Since the advent of scientifically controlled soil-cement construction nearly 20 years ago, more than 6,000 different soils have been tested. For the sandy soils short-cut procedures are now ready.

Investigate this quick, simple method of obtaining cement factors in soil-cement construction. Write for your free copy of a new booklet, "*Short-cut Soil-Cement Testing Procedures for Sandy Soils.*" It is distributed only in the U.S. and Canada.

PORTLAND CEMENT ASSOCIATION
DEPT. A9b-17, 33 WEST GRAND AVENUE, CHICAGO 10, ILLINOIS

MEN AND JOBS

Illinois Tech names civil engineering head

Elmer I. Fiesenheiser was appointed director of the Civil Engineering Department, Illinois Institute of Technology on Sept. 1, according to R. G. Owens, dean of engineering.

Feisenheiser received his B.S. in C.E. degree from Purdue University in 1930 and in 1946, his master's degree from Illinois Tech with which he has been connected for the last 10 years. He also has served as structural engineer for private companies and the federal government, and has done consulting work. He succeeds Frank W. Edwards, resigned (ENR Aug. 6, 1953, p. 56).

Construction firm launches engineer training program

Recognizing the growing need of contractors for college trained engineers, Merritt-Chapman & Scott Corp. has taken the first step toward training young engineers especially for the construction industry.

The aim of the program is to give engineering students an on-the-job insight into the practical side of construction work. The firm believes that this experience not only will prove beneficial to students in senior year studies, but also will encourage them to chose a career in the construction industry.

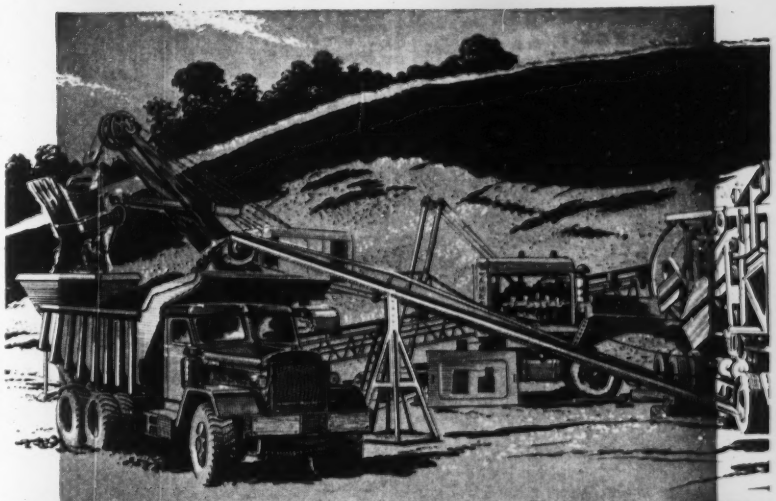
This is how the plan works. During summer vacation, junior year students from 13 engineering schools have been assigned to the company's major construction projects and offices around the country. Then—after graduation

Indispensable engineer

"I want to keep Mr. Brown as long as I can, because he knows so much about the city's streets."

That's what the city engineer of Louisville, Ky., has to say about Edward J. Brown, his assistant. And that's what Louisville officials have been saying about Brown for years. Result is that although he's 84 he's still on the job—after half a century.

Brown, who seems to have the only complete layout of the city's streets, has been talked out of resigning many times before. Seems the street information so needed by his department is mostly in his head, accumulated there from the days when street data simply were not kept.



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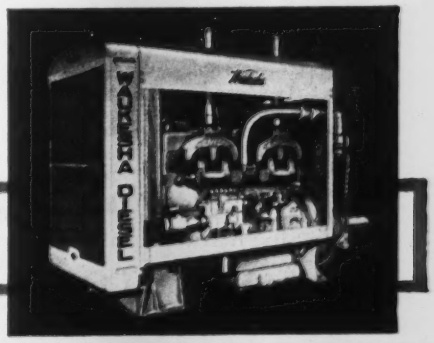
1197 cu. in. 6-WAK Series

POWER UNITS

WAKU	Medium Speed, Gasoline	206 hp at 1500
WAKBU	High Speed, Gasoline	255 hp at 1800
WAKDU	Normal Diesel	212 hp at 1800
WAKDSU	Supercharged Diesel	325 hp at 1800

Standard or Counterbalanced Crankshafts

● Super duty! That's what the 6-WAK power units are for . . . and what they do. Here's what they have—every detail built for rough and tumble service . . . crankcase-cylinder block is a deep, thick-wall casting . . . massive, drop-forged, 7-bearing hardened crankshaft . . . pressured oil to every internal bearing, gear, and shaft . . . dual spring overhead valves with Stellite seats . . . cam ground, heavy-duty pistons . . . full-length water jacket, with removable liners . . . and other modern features—for clean burning, high economy, lively performance and long life. Send for Bulletins.



6-WAKDU DIESEL UNIT
6-cylinder, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement.

216

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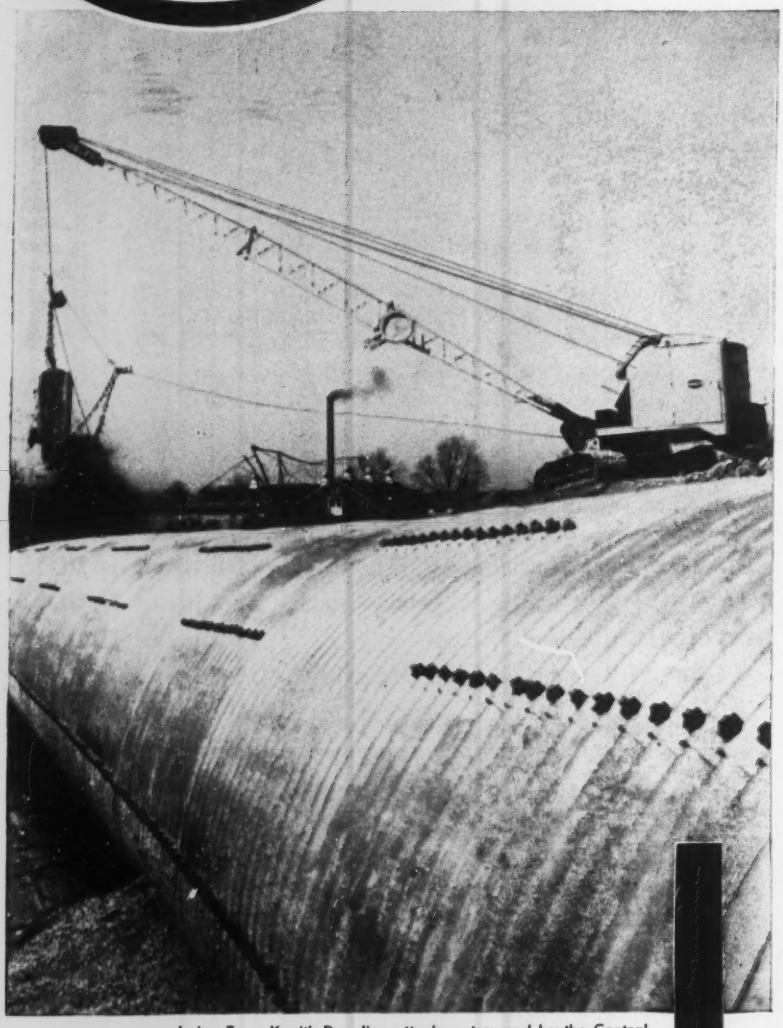
BACKFILLING AFTER PIPE INSTALLATION



Insley Type K with Dragline attachment owned by the Central Engineering and Construction Co. of Indianapolis

The Insley Line includes excavators and cranes, 5 to 30 ton capacity • rubber or crawler mounted • gasoline, diesel or electric powered. There's an Insley working near you backfilling after pipe installation.

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in 1954—permanent positions will be provided for at least five of the students. And a fund of $1,000 will be offered each of the cooperating schools for the general purpose of engineering education.

Careers . . .

• **Government appointments**—**Col. George H. Walker** has been named acting district engineer of the San Francisco district, Corps of Engineers. Succeeding Col. Walker as the district's executive officer is **Col. Sydney Shelley. W. J. Tavelle** has taken Col. Shelley's place as chief of the construction division . . . The new Hawaii Irrigation Authority has appointed **Louis H. Herschler** as planning engineer. He has been engineer in charge of distribution with the Honolulu Board of Water Supply . . . The Interior Department has named **H. A. Hewett** of Durant, Okla., as assistant to the administrator of the Southwestern Power Administration.

• **Local government appointments**—**Allan E. Gifford** has been appointed deputy commissioner of the Massachusetts Department of Public Works . . . **Raymond E. Wetzel,** smoke abatement chief at Evansville, Ind., has been named superintendent of the Indianapolis Bureau of Air Pollution Control . . . **Newton F. Ronan,** assistant district engineer for the New York State Department of Public Works in Utica, will be transferred to the Albany office. **Amasa Stewart** will take over in Utica . . . **Dewey S. Wright** has been named Denver city engineer, replacing **Terry J. Owens** who has joined the Automotive Safety Foundation in Washington, D. C. **C. W. Harness,** city sanitary engineer, will take over Wright's job as deputy city engineer.

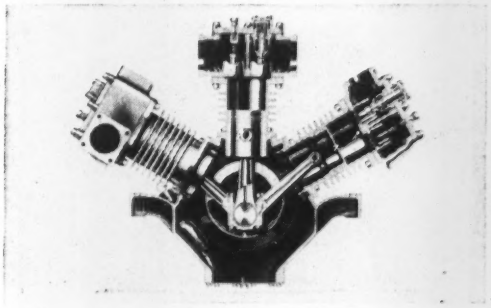
• **Changes**—**O. R. Bailey** has been named chief construction engineer of Monsanto Chemical Co.'s phosphate division in Anniston, Ala. **Ralph Neubert** will succeed Bailey as maintenance superintendent at the plant in Monsanto, Tenn. . . . **Robert P. Cunningham,** Oxford, N. C., contractor, will be senior inspector for Wyatt C. Hedrick, Richmond, Va., engineers and architects, on construction of an Iceland Army base . . . **Bailie G. Brown** has been appointed assistant controller of Kaiser Engineers Division of Henry J. Kaiser Co. in Oakland, Calif. He was formerly administrative manager-controller for Construction Management & Engineering Associates in Paris . . . **Gordon R. Williams** has been

How long since you checked your compressor's fuel consumption?

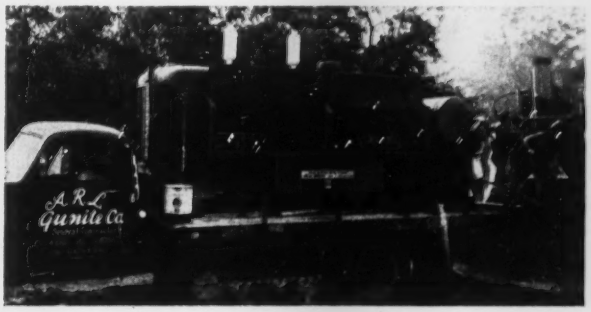
These figures will show you how Worthington Blue Brutes may save you as much as 1500 gallons of fuel during an average operating year

COMPRESSOR SIZE	ENGINE TYPE	GALLONS OF FUEL PER HOUR AT 80 PSI	GALLONS OF FUEL PER HOUR AT 100 PSI
60'	GASOLINE	1.31	1.42
105'	GASOLINE	2.16	2.35
	DIESEL	1.66	1.73
160'	GASOLINE	3.18	3.44
	DIESEL	2.45	2.60
210'	GASOLINE	4.32	4.70
	DIESEL	2.89	3.06
315'	GASOLINE	6.25	6.75
	DIESEL	4.38	4.64
600'	DIESEL	6.30	9.20

HOW DOES YOUR COMPRESSOR STACK UP in comparison with the Blue Brute for fuel economy? The figures shown have been determined under normal field operating conditions.



"SURE ARE EASY TO SERVICE." That's what we hear about Blue Brutes from mechanics all over the country. No special tools or complicated disassembly procedures are needed. And compressor uses same oil as engine.



PLENTY OF RESERVE HORSEPOWER is standard with the Blue Brutes. It takes thousands of hours of normal operation before engine wear affects the compressor's output. This means you get full-rated output even though the engine hasn't been in the shop for a long time.

Get the rest of the Blue Brute story from your nearest Worthington distributor. Or write to Worthington Corporation, Construction Equipment Division, Section H.3.5, Plainfield, N. J.

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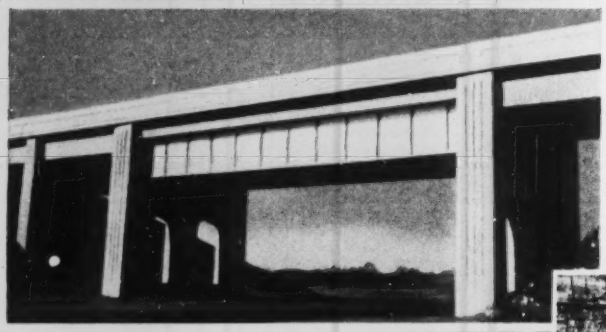

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appointed associate professor of civil and sanitary engineering at Massachusetts Institute of Technology. He has been with the New York City consulting engineering firm of Knappen, Tippetts, Abbett & McCarthy . . . Universal Atlas Cement Co. has named two assistant chief engineers: **Chester D. Rugen,** former projects engineer; **Robert B. Jordan,** former assistant chief construction engineer for the construction engineering bureau of U. S. Steel Corp., Morrisville, Pa. . . . **Edward Green** has been appointed resident engineer in charge of the Nickel Plate Road grade elimination project at Fort Wayne, Ind. He formerly served with the Nickel Plate engineer's department in Cleveland . . . **John R. Snowball** has been named consulting engineer to The Marietta Concrete Corp., Marietta, Ohio. He has been with the Portland Cement Association in Columbus as housing and products engineer, structural engineer and quality concrete lecturer for the district office . . . **N. Rulison Knox** has resigned as vice-chairman of the board of Bucyrus-Erie Co., South Milwaukee, Wis., to become assistant to the board chairman of Poor & Co., Chicago . . . **Edward Cothran,** North Carolina roadway design engineer, will join the Carolina Asphalt Association as executive director and treasurer. **T. N. Park,** chief highway draftsman, succeeds Cothran. **Dan Allen** steps into Park's old post.

• **Elected**—**J. Delano Hitch, Jr.,** has been elected president of The Dorr Co., Stamford, Conn., engineers. **E. R. Ramsey,** retired president, has been elected vice-chairman of the board; he also will serve as a director and consultant of the firm.

• **Honored**—**Richard A. Haber,** former chief engineer and now consultant for the Delaware State Highway Department, was honored recently at a dinner given by the roadbuilders' division of the Associated General Contractors in Wilmington, Del. . . . **Col. Herbert D. Vogel,** Southwest Division Engineer, Corps of Engineers, Dallas, Tex., received the Department of the Army's Award of Merit for safety. His division's accident, injury and fatality rate decreased 28% last year.

• **Retired**—**Samuel D. Culver** of Delmar, Del., has resigned from the Delaware State Highway Commission . . . **R. A. Thomas,** director of the city public works department at Winston-Salem, N. C., will retire Oct. 1.

Bruning COPYFLEX "20"...
ideal whiteprinter for the smaller office

Get prints in 5 minutes!

There's no waiting for prints with a COPYFLEX "20" in your office.

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Here's why the COPYFLEX "20" is ideal:

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SPEEDS DELIVERY of ready-to-use prints
NO FUMES to be exhausted . . . no expensive plumbing or ventilation system required
OPERATES ANYWHERE — simply connect to a standard 115-volt a-c power line
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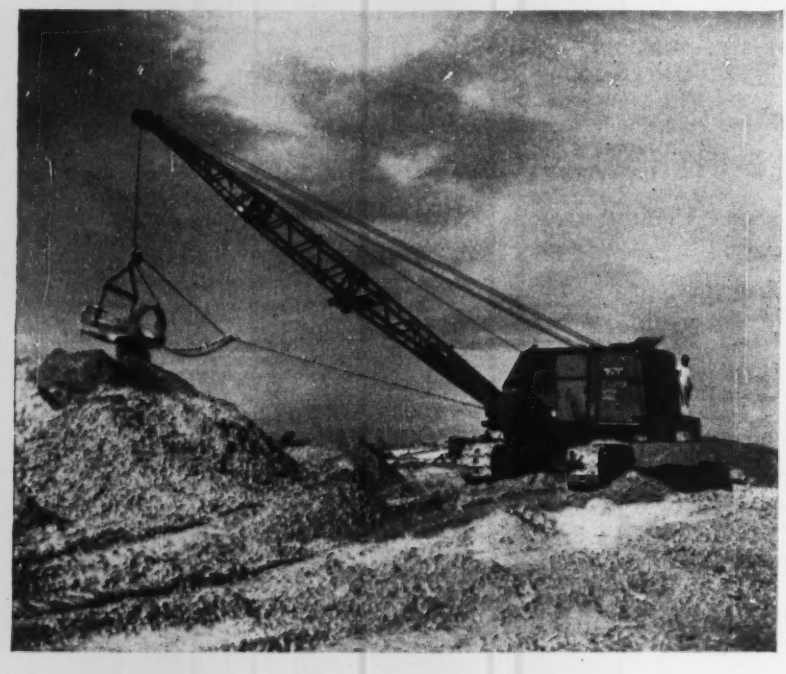
Caterpillar Diesel armada pushes through new Pensacola jet base

THIS NO. 12 Motor Grader is leveling one of the long jet runways at the Forrest Sherman base.

A CAT D13000 Diesel Engine powers a Bucyrus-Erie dragline, moving shell from stock pile to crusher.



Building the roads and runways for the new Forrest Sherman jet base at Pensacola, Florida, is pretty much a Caterpillar show. Smith Engineering & Construction Co., of Pensacola, uses about 75 of the big yellow machines, including all types of equipment.

The land on which the installation is being built was an Army fort during the last war, and will now become part of the big Pensacola Naval Air Station. The runways are 70% crushed shell mixed with 30% sand and spread 17 inches deep. This is compacted to a 12-inch finished base.

Earth taken from the cut for the runways is used as fill for a new entrance road to the field. 180,000 cubic yards will be moved on the road-building job, and it is being done by fast Cat DW21 Tractors and No. 21 Scrapers, hauling loads up to 20 heaped yards.

A Woods mixer, pulled by a D8 Tractor, is used for rapid mixing of the runway material. And Cat No. 12 Motor Graders prepare the ground and level the mix.

Mr. A. W. Gordon, Superintendent, says: "At one time we had about 50 machines of other makes. We've gradually sold them out and standardized on Caterpillar. I'm partial to them, having worked one of the first tractors sold, back in 1928. Some of our

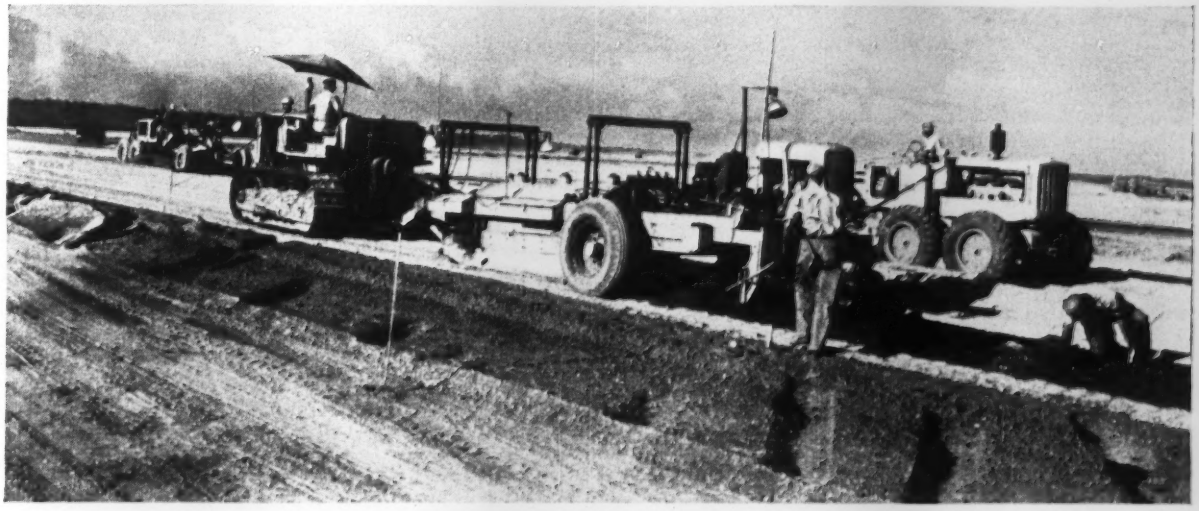
present Cat equipment is more than 10 years old and still running strong."

Standardizing on Caterpillar machines is sound practice. It simplifies the problem of operator training, allows quick repairs with interchangeable parts, and places undivided responsibility on one manufacturer and one dealer.

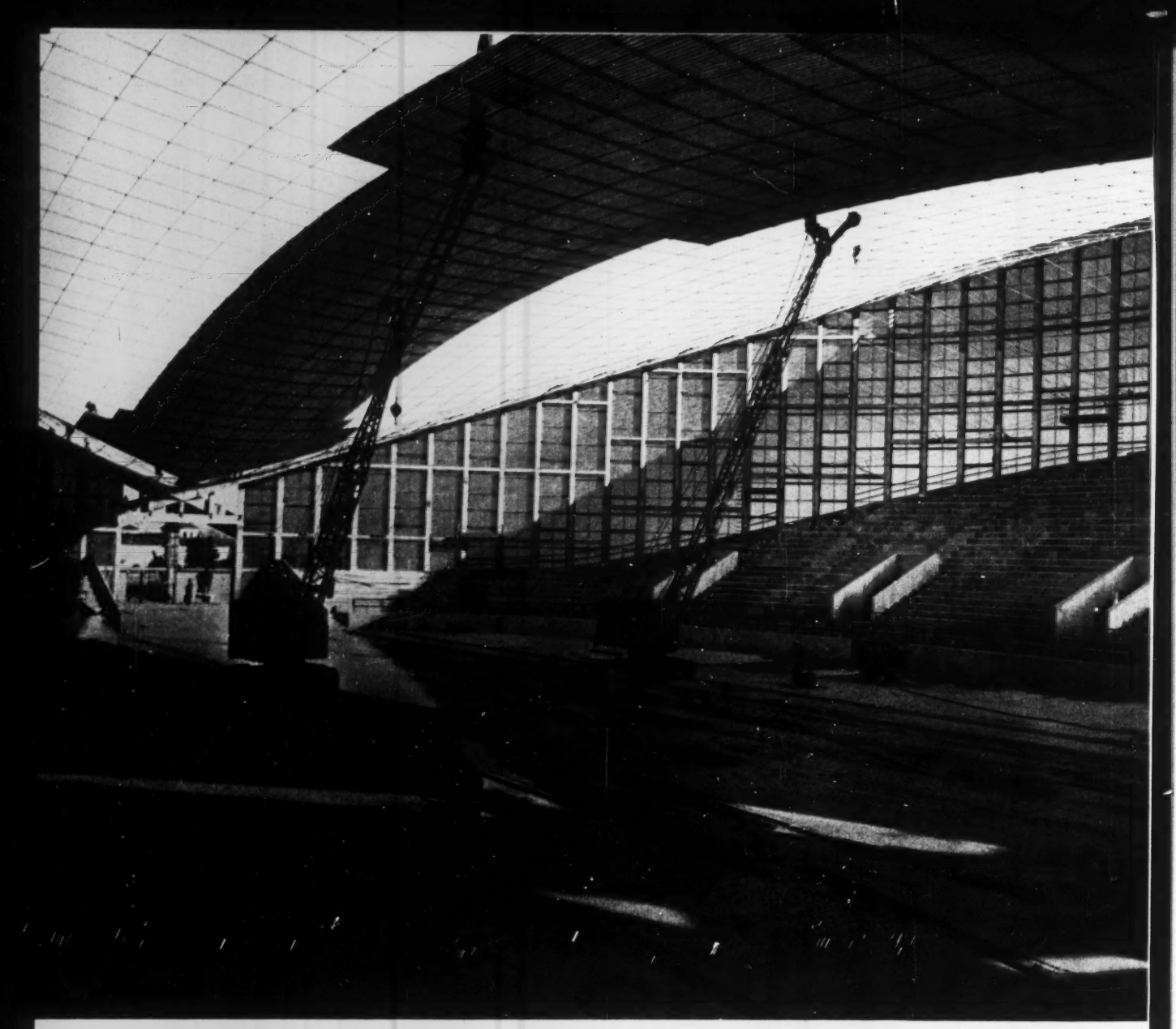
Your Caterpillar Dealer has the right equipment for your job, and he'll back its rugged stamina and long work life with reliable service and genuine Caterpillar parts. He's as close as your phone. Call him today.

▲ ROLLING at 20 mph., a Cat DW21-Scraper unit hauls big loads fast for building an entrance road.

▼ A CATERPILLAR D8 Tractor pulls this Woods mixer, laying crushed shell and sand for a runway.



CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS



Wire Rope at Work — Perhaps the most unusual building of our time is the State Fair Arena at the State Fair Grounds, Raleigh, N. C., shown here while construction was in progress. Startling in design, this steel-and-concrete structure is some 300 ft long by 300 ft wide, with sides that rise gracefully in perfect arcs. But its most striking feature is the gently-curved roof, which is supported entirely by Bethlehem steel cables.

Forming a grid with 6-ft x 6-ft squares, the cables, zinc-coated for resistance to corrosion, are securely anchored to the framework of the building and are fastened together at points of intersection. Bolt-clipped to the grid are corrugated metal sheets which, with the topping, constitute the roof proper. This ingenious application of steel cable—a member of Bethlehem's wire rope family—has already aroused wide interest and may well suggest a new trend in design and construction.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others:
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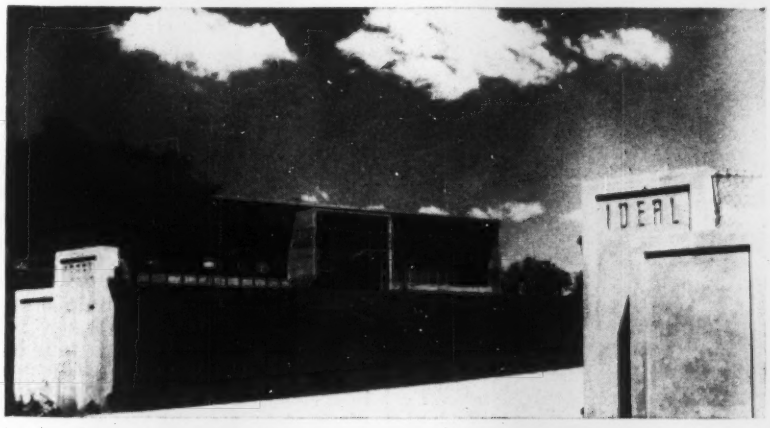

Concrete research center dedicated

The production of lightweight concrete aggregates will be among the research projects studied at a new laboratory dedicated Aug. 19 at Boettcher, Colo., by the Ideal Cement Co.

Cris Dobbins, Ideal president, said that the half-million-dollar research center will engage in basic research on only those subjects where insufficient information exists and on those specifically related to problems unique to Ideal plants or sales areas.

Equipment at the center includes a complete pilot plant with miniature kilns and complete raw materials processing and grinding machinery. Company officials said that it is possible to duplicate the cement production conditions that exist in any one of the thirteen Ideal plants.

Main laboratory units are housed in a two-story architectural concrete unit containing 8,300 sq ft of floor space. The building has physical testing chemical and petrographic laboratories and equipment for the analysis and study of materials that go into the manufacture of cement, lightweight aggregates and concrete. The unit also contains a machine shop, drafting room, library and office facilities for the scientific staff.

Nine contracts awarded for water desalting research

Nine research contracts totaling less than $125,000 are under way in the saline water program of the Reclamation Bureau. These approved contracts are in addition to two earlier projects costing $35,000. The eleven contracts to date still leave about $365,000 of the $525,000 voted by Congress for the project.

Interior Sec'y Douglas McKay and the Reclamation Bureau hope to arouse the interest of more researchers and bring some new approaches into the program. David S. Jenkins, research coordinator, is looking for possibilities among private laboratories and institutions to aid the search for low-cost methods of converting salt and brackish water to fresh water fit for use by human beings, and for irrigation and industry.

During hearings on the bill that set up the research program, scientists told Congress that the present need is for research to develop processes rather than for costly demonstration plants envisaged in earlier legislation. There are several workable processes in operation now, but the costs are too high for general application.

Research projects already under way are trying by various means to lower the cost of water processing. One of the nine contracts recently approved is with Dr. George O. G. Lof of Denver that calls for the determination of the best method or methods for low-cost demineralization of saline water through the use of solar energy.

The University of Florida has contracted to conduct laboratory research in the development and testing of synthetic osmotic membranes to be

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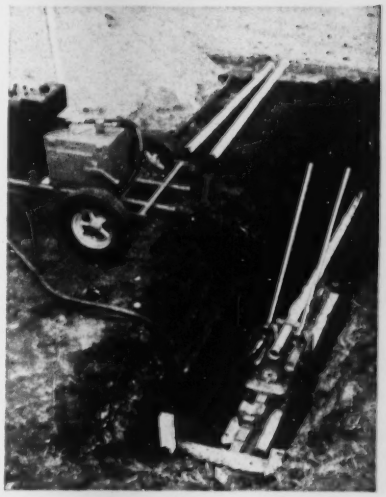

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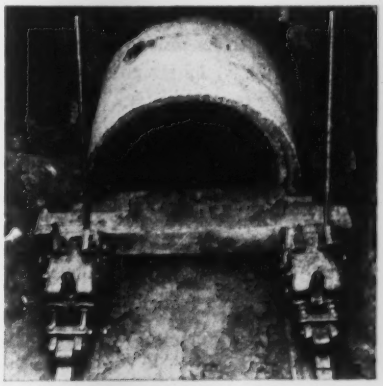
Here's the simple, cost-cutting way to install underground pipe. Speed your jobs with a GREENLEE Pusher. One-man-operated, portable, simple to operate. No tearing up of pavement . . . eliminates extensive ditching, tunneling, backfilling, tamping, repaving. Cuts job time to a fraction. GREENLEE Hydraulic Pipe Pusher often pays for itself on first job. Two sizes — model shown above for pushing 3/4" to 4" pipe. Larger unit, below, for pipe over 4", concrete sewer pipe and large drainage ducts. Power pump (as shown above) also available for extra ease and speed of operation.



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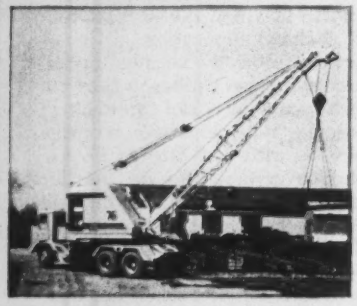
New Cranes Designed for More "On the Job" Time!

Handle all types of precision steel erecting, concrete work and any crane, clam, magnet or dragline job with the new standard-duty 75A or heavy-duty 75B Gar Wood cranes! . . . Collapsible high gantry simplifies raising of longest booms . . . Pendant cables speed changing of boom lengths . . . Optional *power load lowering* and *fluid coupling* give smoothest possible crane operation . . . Hammer head boom point keeps cable away from boom — gives added boom strength — keeps cable costs low . . . Crane sections pin and bolt connected for rigidity and strength . . . Right angle drive, power actuated hoist clutches and conical hook rollers . . . Easily converted to all attachments including the new, exclusive Gar Wood Foundation Borer!

FOR LIFTING POWER with MOBILITY

A Gar Wood 75BT truck crane will do the job. Lifts up to 40,000 lbs. Has all the heavy-duty features yet gets around fast. Ideal for long boom and steel erection work.



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F-532

used in separation of salt from water.

Yale University will conduct investigations of a method of improving heat-transfer rates in vapor compression evaporators.

Heinz Engineering Co., Arlington, Va., has been assigned the study of developing an improved method for analyzing vapor-compression distillation cycles.

A study to determine more exactly the actual energy demands, including energy losses, as compared with theoretical thermodynamic minimum energy requirements is being carried on under the direction of Dr. George W. Murphy, professor of chemistry and chairman of the department at the State University of New York at Albany.

Battelle Memorial Institute, an industrial research laboratory in Columbus, Ohio, will undertake studies in the evaporation of saline waters by steam from solar radiation.

The South Dakota School of Mines will conduct an inventory of saline water resources as a basis for development of processes.

Texas A & M Research Foundation is to explore the possibility of separating salt from water by a solvent extraction process similar to that used for the separation of certain industrial fluids.

The University of Minnesota is to prepare a survey of waste heat that might be harnessed and put to use in any of the separation processes.

The two earlier contracts were made on developments that were already under way by others. The larger contract is with Ionics, Inc., of Cambridge, Mass., to investigate the process variable of an electrical membrane demineralizer applied to typical brackish water and to sea water. Emphasis is on minimizing the cost of demineralizing water by this process.

The smaller grant was made to the University of California at Berkeley and calls for testing and evaluating existing laboratory installations of a diesel waste heat plant, a solar still and a low-temperature difference plant. Dean E. D. Howe is directing this project.

Geodetic measuring tapes get new test

A new method for determining the coefficients of linear thermal expansion of invar (nickel steel) geodetic measuring tapes has been developed by Peter Hidnert and R. K. Kirby of the National Bureau of Standards. Based on a determined relationship

Ask any user about

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FOR FASTENING INTO STEEL AND CONCRETE

Outnumbering all other makes combined by better than 2 to 1, RAMSET SYSTEM is the undisputed leader among powder-actuated fastening methods. For six years, thousands of users have proved that strong, sturdy RAMSET Tools, with many built-in features and the widest variety of Tru-Set Fasteners, pay "DIVIDENDS UNLIMITED," like these:

CASH SAVINGS—costs reduced from $2.53 to 24 cents per fastener . . . saved $15,000 on 50,000 fastenings . . . cut over-all cost by 87 per cent.

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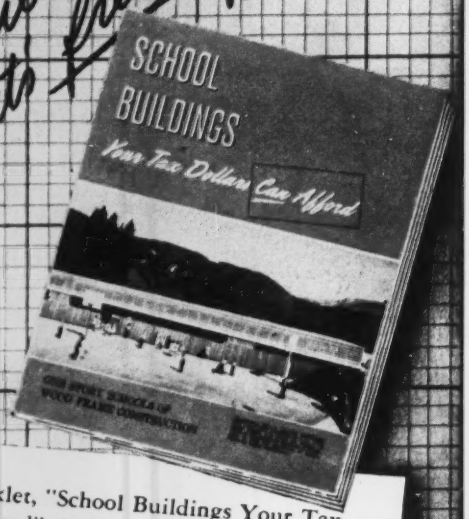

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between the electrical resistance and the temperature for each tape, the NBS technique consists principally of measurements of expansion and electrical resistance of the tape when heated by passing a direct current through it without changing the temperature of the laboratory. The new method is not only more precise but also more rapid and convenient than the previous method, which required measurements at different ambient temperatures.

Engineers seek way to suttle fish past dams

The University of Washington has been awarded an $85,000-contract by the Corps of Engineers for research to determine how to coax downstream migrant salmon and steelhead safely past dams that may obstruct their course.

One phase of the study will seek ways of getting fish around dams by electrical methods, light, changing water velocities and temperatures. Fish and game agencies of Washington, Oregon and Idaho will cooperate in the study with the university's School of Fisheries.

Asphalt and concrete highway studies begun

The Tennessee highway research program, a cooperative effort of the Tennessee Department of Highways and Public Works and the University of Tennessee, has been set up to determine suitable standards for asphalt and concrete pavements.

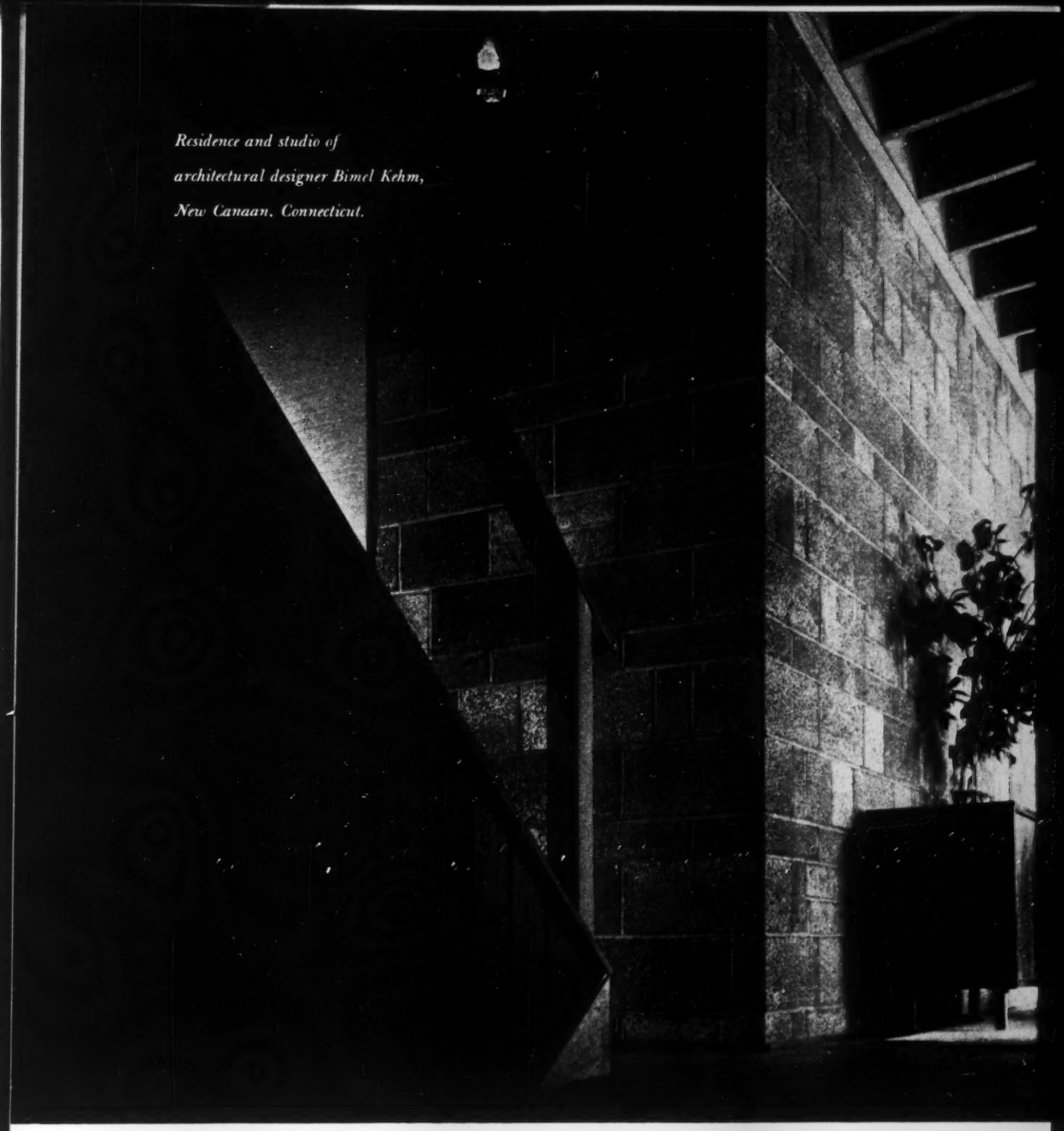
The program is under the direction of E. A. Whitehurst and will start a new series of fundamental studies as soon as the project can be put into action. The cooperative program is administered by the University of Tennessee through its engineering experiment station, making use of the facilities of the station and those of the department of engineering.

Funds are provided on a contract basis between the university and the Department of Highways and Public Works as provided by a legislative act of 1951.

Post-atom attack cleanup methods reported

Dr. Foster D. Snell, president of the consulting chemical firm of Foster D. Snell, Inc., has released the results of a two-year research program on the cleaning of surfaces contaminated with radioactive debris.

These results indicate that the



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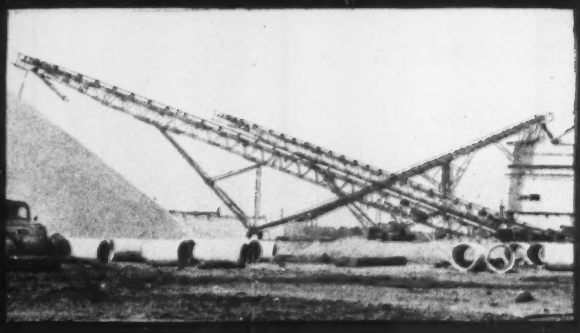

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PJJ92

major part of decontamination can be done with ordinary cleaning materials, but it was found that heavy-duty synthetic detergents were generally more effective than either light-duty detergents or soap. Further, there is a class of chemical compounds known as sequestrants that have the property of "locking up" in the compound many elements such as the rare earths produced by fission.

There are several of these sequestrants including ethylene diamine tetraacetic acid, pyrophosphates, tripolyphosphates and citrates, but it was reported that the most economical to use is a modified form of sodium hexametaphosphate. When two parts of the chemical are mixed with one part of either soap or synthetic detergent and applied in a one per cent solution of water, removal of radioactive contaminant from practically all surfaces is reported to be nearly complete. As a typical example, water removed 47 per cent of contamination from frosted glass, a one per cent solution of soap removed 81 per cent, but in admixture with the preferred sequestrant 98.8 per cent was removed.

An exception was found in the case of gypsum plaster where removal by plain water was better than with any cleaning agent.

It is reported that, in general, the harder and smoother the surface, the easier it is to decontaminate. With the exception of plaster, decontamination to better than 90 per cent offers no great difficulties if the appropriate materials are available.

High capacity load calibrators developed

The development of load calibrating devices of unusual size and capacity by the National Bureau of Standards will permit the standardization of the largest materials testing machines in existence. The four NBS 3-million-pound capacity compression dynamometers recently completed can measure forces up to 6,000 tons accurately. Prior to development of these dynamometers the highest load that could be measured accurately was approximately 1,250 tons. To do this required the simultaneous use of a considerable number of calibration devices, such as proving rings, of 100 and 150-ton capacity.

It is estimated that a testing machine can now be calibrated to 5,000 tons in about one-fourth the time and at about half the cost required to calibrate it to the former maximum.

Newest facility of Piasecki Helicopter Corporation, Morton, Pa. — builders of the famous Piasecki Work Horse, biggest of all rotary-wing aircraft. Entrance formed of Round-the-Corner Slide Doors and Straight Slide Doors, all 38 feet in height, all fabricated by International Steel Company.

- ROSENGARTEN & KRAEMER, Philadelphia Architects
- WARK & COMPANY, Philadelphia General Contractors

"Starting Gate"

FOR PIASECKI WORK HORSES

Ever-growing interest in the commercial possibilities of 'copters . . . together with recent and extensive Government contracts . . . made this further expansion of facilities an immediate requirement for Piasecki Helicopter Corporation.

Entrance specifications for this newest plant were highly exacting—emphasizing fast and safe operation under all conditions, and earliest possible installation. And International Steel came through with flying colors on every count.

Producing these special hangar doors for flying "work horses" — meeting Piasecki's *every* requirement *most economically* — typifies the advantages offered in International's fully integrated steel fabrication services. Next time you need such service, put International's experience to work for you. Or, if you're faced with a steel fabrication problem now—write *right now* and tell us about it.

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Steeltex was used to reinforce the concrete floors in the $10-million Park View Apartments at Collingwood, N.J. Knopf and Oshiver, Architects. Built by Sylvester J. Lowery and E. J. Frankel.

How STEELTEX* helped save up to 10% of floor costs on multi-million dollar apartments in Philadelphia and suburbs

The residential trend toward the suburbs in Philadelphia during the last three years has been highlighted by construction of some of the country's outstanding private apartment plans.

Commercial building of this type must incorporate economy in design, speed in construction and low maintenance cost in the finished building to get a maximum return on the investment. It is not surprising, therefore, that these projects, totalling some $29 million, have some interesting features in common.

"Substantial savings have been reported by owners in this area through the use of Steel Bar Joists and STEELTEX in comparison with reinforced concrete construction," reports the head of a large contracting firm that has participated in many of these projects. Here's why:

1. In design of the floors, *no additional reinforcing was necessary* with STEELTEX. The crimped stitch wires permit the backing of STEELTEX to fall away from the reinforcing mesh under the weight of the concrete. Thus, the wire mesh is imbedded in the concrete.

2. Installation costs on these projects have shown that STEELTEX has been installed *at a saving of approximately 10%* over the installation of centering material requiring additional reinforcing in the form of mesh.

3. Savings in concrete have been reported *as high as 10%* through the use of STEELTEX. In pouring a 2½" slab, for example, sag loss for STEELTEX was reported approximately ¼" compared to ½" or ¾" for other types of centering material. Finally, waterproof backing on STEELTEX virtually eliminated drippings on the floor below and prevented the loss of cement and fines, resulting in a better quality concrete floor. Clean-up time was reduced to a minimum.

These savings carried through into every phase of these apartment projects in Philadelphia. A skillful coupling of contemporary design and economy in construction, without sacrificing value in construction, has made this vanguard of new projects commercially successful. Proof lies in the dozens of new projects now in planning stages throughout the area, most of them incorporating the advantages worked out on these initial buildings.

Whether your projects involve apartments, schools, banks, hospitals, or warehouses; you, too, can achieve the same results. See the STEELTEX catalog in Sweet's or write for catalog.

One man can roll out a 125' roll of Steeltex in a few minutes. Steeltex provides both waterproof form and steel reinforcement for concrete floors.

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**Steeltex is a registered trade-mark of the Pittsburgh Steel Products Company.*

▲
The massive Parkway House overlooking Philadelphia's famed Parkway contains Steeltex and concrete floors. The $3.7-million apartment house was designed by Roth and Fleisher. Stanwell Construction Co. was general contractor.

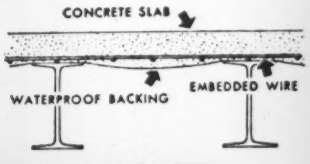
Listed below are other important apartment houses in the Philadelphia area in which Steeltex was used.

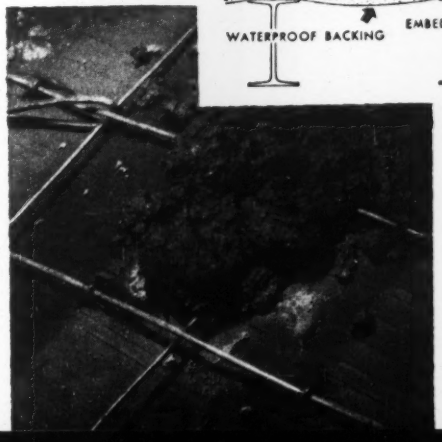
- **Duval Manor Apartments**
  Philadelphia, Pennsylvania
- **Latches Lane Apartments**
  Merion, Pennsylvania
- **Pelham Park Apartments**
  Philadelphia, Pennsylvania
- **Wynnewood Apartments**
  Wynnewood, Pennsylvania

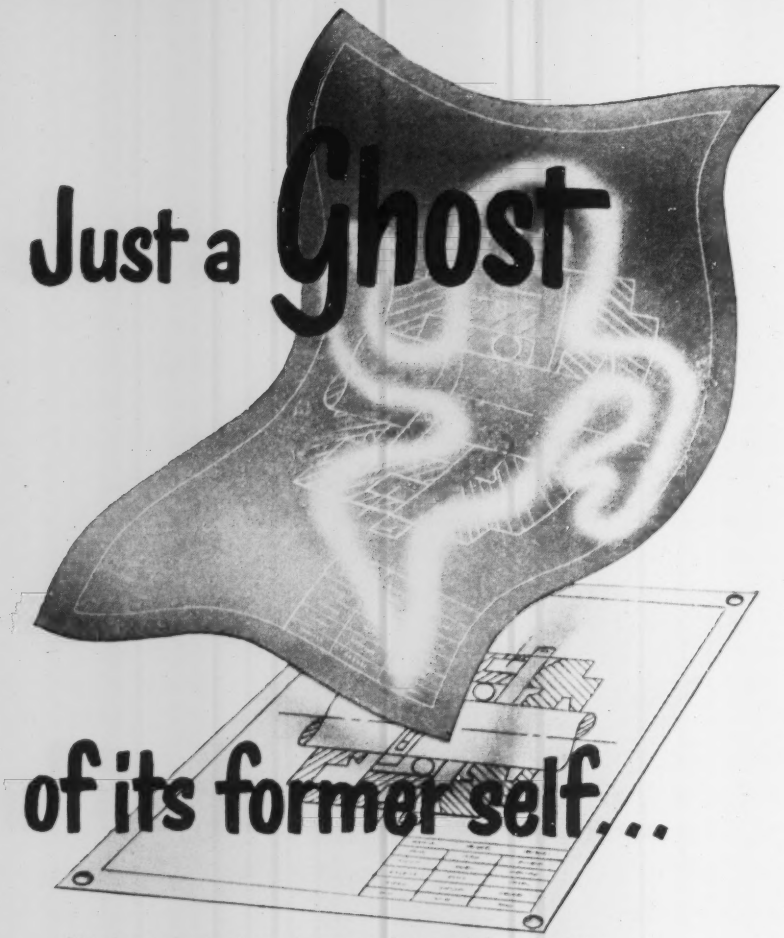
Note: In the cross section and closeup the weight of the wet concrete forces the backing away, which permits the galvanized welded wire mesh to assume its proper position in the slab. Steeltex Floor Lath also performs two other functions. It permits work on the floor below while pouring is in progress and retains moisture to assist proper curing.

▲
The $7.5-million Presidential Apartments at City Line Ave. and Presidential Blvd. in West Philadelphia contain Steeltex and concrete floors in all buildings. Mayer I. Blum & Sons, Architects; Turner Construction Co., Contractor.

The attractive School Lane House Apartments in Philadelphia's historic Germantown section cost $2.5 million. All floors are concrete, reinforced with Steeltex. Arthur F. Deam, Architects; Turner Construction Co., Contractors.
▼







You have to expect some erasures here and there on your drawings. But watch out! When those drawings get to the blueprint stage, lines can become weak and washed out . . . just *ghosts* of their former selves.

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BOOKS

How design theory evolved

HISTORY OF STRENGTH OF MATERIALS—By Stephen P. Timoshenko. 452 pp. McGraw-Hill Book Co., 330 W. 42nd St., New York 36, $10.00.

Development of our knowledge of strength of materials is reviewed in this book by a master of the subject. Professor Timoshenko (Stanford University) has lectured on it for 25 years, during which time he also wrote such well known books as Theory of Elasticity, Theory of Elastic Stability, and Theory of Plates and Shells.

The subject, strength of materials, is so intimately related to the theory of structures and theory of elasticity that the author found it necessary to include the more significant developments in those fields, too. In addition, he discusses the relation of progress in strength of materials to the state of engineering education and industrial development in various countries.

Starting with a brief outline of the accomplishments of ancient Egyptians and Greeks, the author credits the former with empirical design rules and the latter with the development of statics.

During the Renaissance, the biggest boost came from Leonardo da Vinci, whose notes indicate that he had grasped the method of moments and knew how to use the principle of virtual displacements.

Three men were outstanding in the 17th Century—Gallileo, who investigated the laws of falling bodies and experimented with beams; Robert Hooke, who established the relationship between forces and deformations; and Mariotte, who introduced elastic deformations in the theory of bending and used experiments to check his hypotheses.

During the 18th Century, scientific investigation methods were gradually introduced in various fields of engineering.

The first schools of engineering were founded and the first books on structural engineering published. France led in this development, the author points out, and can be credited for most of the progress in mechanics of elastic bodies.

When testing materials, 18th Century engineers were chiefly interested in ultimate strength and gave little heed to the elastic properties of their specimens. During the next hundred years, this attitude was reversed. Thomas Young introduced the notion of modulus of elasticity. Navier devel-

(*Continued on page 101*)

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When you buy a piece of Cat* equipment, you think of a lot of other things besides tough steel and yellow paint. Things you can't see or feel or touch, but that will help you make *more money this year—and year after year!*

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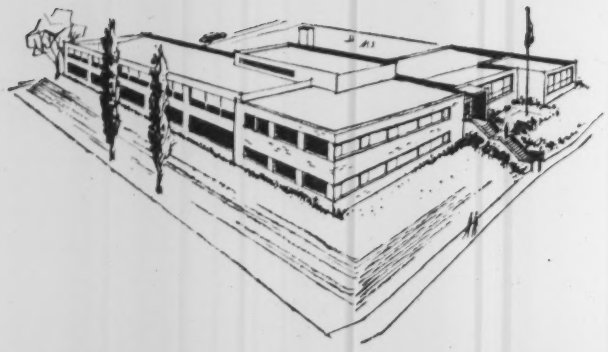


Low construction costs demonstrate

r plywood concrete forms helped set a new standard in low construction cost on 46,891 sq. ft. Lowell Elementary School, Tacoma, Wash.

THREE KEY ADVANTAGES OF FIR PLYWOOD FORMS

1. TIME AND LABOR SAVINGS

Use of fir plywood forms for the striking architectural concrete of this school helped established a new record for low school construction costs in Washington state. Allowing only half area* for the lower floor play area and maintenance rooms, Tacoma school officials give $9.91 per square foot as the complete construction cost, including taxes and fees. Architect Irvin E. Muri credits fir plywood forms with playing an important role in helping hold costs to this low figure—some 20 per cent below the average cost for schools in the state.

2. SMOOTH, FIN-FREE CONCRETE

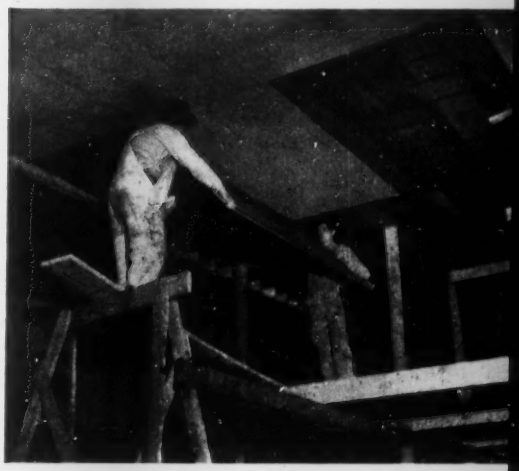
Flat, monolithic plywood-formed surfaces, both inside and outside the building, were merely sack-rubbed and then painted—a major factor in the low cost. In addition to forming both interior and exterior walls, fir plywood was used to form ceiling slabs and retaining walls.

3. ECONOMY THROUGH RE-USE

Up to 6 re-uses of the plywood forms were reported by the contractor. In addition, many of the panels were later re-used on other jobs. C. E. Bonnell, President of the Bonnell Construction Company, job contractors, reports that the plywood forms were satisfactory in every respect and that they helped speed work and cut costs all along the line.

**Allowing full area or the lower floor the complete per square foot construction cost comes to $7.85.*

Construction view shows forms in place for floor slab and walls. ⅝" plywood panels were placed across 2x6 joists on 16" centers. This was backed up by 2x10 stringers supported by 4x4 and 4x6 posts. The 8" thick walls were also cast against ⅝" Exterior-type plywood panels.



View shows stripping off ceiling forms. Smooth fir plywood panels permitted structure and finish surface to be cast simultaneously. Exposed concrete surfaces both inside and out, were painted direct after a minimum of rubbing, eliminating expensive plastering on ceilings.

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For further information write Douglas Fir Plywood Association, Tacoma 2, Washington.

LOWELL ELEMENTARY SCHOOL
LOCATION: Tacoma, Washington
ARCHITECTS: Lance, Muri & McGuire, Tacoma
CONTRACTORS: Bonnell Construction Co., Tacoma

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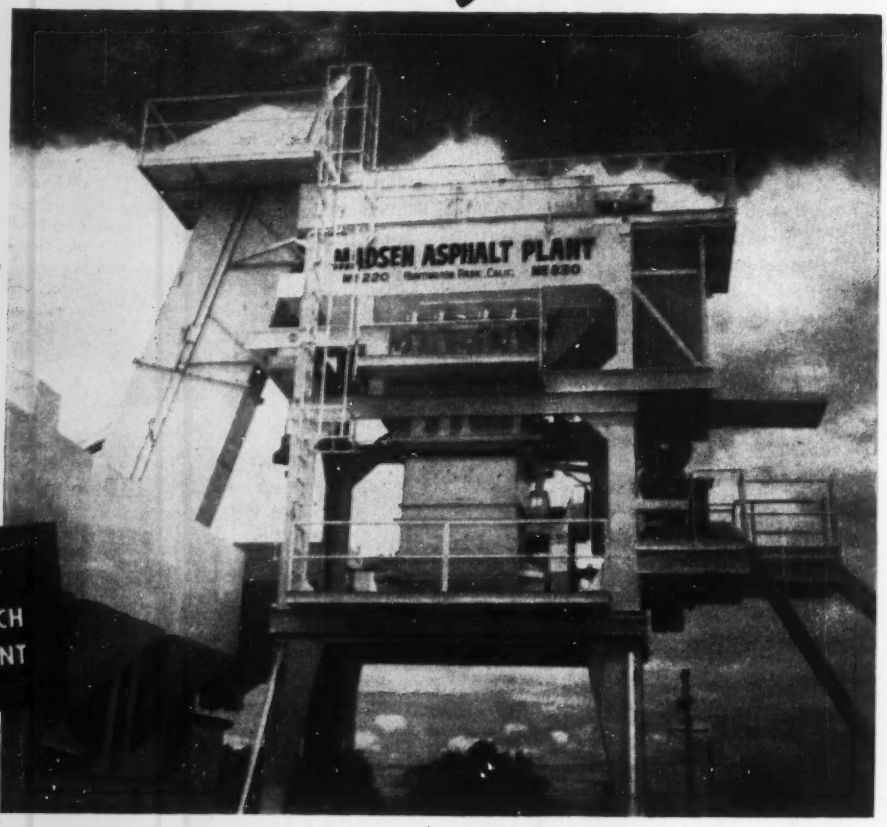

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oped the differential equations of equilibrium in terms of strains from the molecular theory of an elastic body. Cauchy injected the idea of stress and derived the differential equations of equilibrium in terms of stresses.

French engineers during the first half of the 19th Century concentrated on development of the mathematical theory of elasticity. Meanwhile, British engineers studied strength of materials experimentally, stimulated by the industrial development of their country and the introduction of cast iron and wrought iron as structural materials. Although this experimental work did not contribute much to the general theory of strength of materials, Timoshenko writes, it was of great use to practical engineers in providing answers to their immediate problems.

Construction of the first railroads greatly affected the development of strength of materials by presenting a series of new problems. Squire Whipple, in 1847, published the first book containing useful information on truss analysis. By the end of the century, stress analysis as we know it today was well established.

After the 19th Century, mechanics of materials developed rapidly. Private industry recognized the importance of scientific research and established research laboratories. In addition, new trends in the machine industries in the 20th Century, development of combustion engines, and success of the airplane made more refined stress analysis desirable. As a result, wider use was made of the theory of elasticity. Also, greater accuracy became necessary in measuring the properties of materials. So new instruments were introduced for measuring stresses and strains and for testing materials.

In recent times, theories of thin-walled structures, elastic stability, vibration and impact have received much attention. New methods have come into vogue for the solution of statically indeterminate structures.

It was the author's intention to cover only the highlights in this history, and this he has done most competently.

Some of the developments that many engineers may consider important have been omitted—reinforced concrete and prestressed concrete theory and testing, for example, and the formation of the American Society for Testing Materials. But perhaps these deficiencies will be remedied in a future edition. In any event, engineers will find that Timoshenko's History of Strength of Materials will not only add to their knowledge of design theory

HERE'S HOW SAUERMAN HELPED A MILL GO UNDERGROUND...

A southern cotton mill needing additional space, decided to go underground and add another floor level below the existing building. Fiske-Carter Construction Co. was selected to do the excavating. Since clearance under the building averaged only about three feet, they used two Sauerman ⅓-cu. yd. Crescent Scrapers running parallel to the columns under the mill to dig the earth and haul it to a central bay. A third scraper, working at right angles, hauled the earth out through a window.

Sauerman Crescent Scrapers are capable of doing the unusual and difficult jobs, as well as commonplace excavating, hauling and stockpiling for storage or delivery. There is a type of scraper that can be economically fitted to almost any materials handling project. Sizes range from ⅓ to 15-cu. yds. Low in first cost, they are economical to maintain and are moderate in power consumption, gasoline, diesel or electric.

Write for Sauerman News-Digest #137 describing the Fiske-Carter story in more detail. Ask for Catalog J which shows Sauerman Scrapers handling a variety of materials in various job applications, including their use with boom machines. Sauerman Bros., Inc., 532 S. Clinton St., Chicago 7, Ill.

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How to increase capacity of boom machines from 50 to 300%, and range up to 400 feet. EFR 219

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High-production method for excavating steep faces with no danger from slides. EFR 202

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DIGGING GRAVEL 65 FEET UNDERWATER
Taking gravel from pit 65 feet below water level, moving 500 feet to processing plant. EFR 214

ROBOT RECLAIMS FROM STORAGE PILES
This machine picks up, transports, and dumps automatically, alone and untended. EFR 225

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Taking tightly-consolidated rock and gravel out of pit 85 ft. below water. EFR 216

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Floating towers and dragline grade banks, construct levees at minimum cost. EFR 103

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EMERGENCY WORK — Day or night, one man can take tool to any location.

but also will give them a better appreciation of the present-day methods employed in the investigation of the behavior of materials.

Miscellaneous notes

• **Protective covers for highway slopes** were the subject of research conducted at Cornell and Rutgers Universities during 1951-52. The results are reported in "Roadside Vegetative Cover Research Project" issued by the New York State Department of Public Works, Albany 1, N. Y. The Bureau of Public Roads cooperated in these studies, which relate to states of the northeastern part of this country. Important findings are that some of the costly steps such as importation of topsoil, the addition of organic materials or sodding are not necessary at many locations. The findings should be of value to airfield operators as well as to highway engineers.

• **Properties of cavity walls** are presented in Building Materials and Structures Report 136 of the National Bureau of Standards. Tests carried out by the bureau indicate that, in general, the behavior of cavity walls, which consist of two wythes of masonry separated by an air space, is very much the same as solid masonry walls built with the same quality and quantity of material. However, cavity walls offer less resistance to transverse loads and provide higher thermal insulation. While the outer wythe may be permeable to wind-driven rain, incorporation of weep holes and proper flashing gives adequate provision against leakage through the inner wythe, the report says. The booklet may be obtained for 15 cents from the Superintendent of Documents, Washington 25, D. C.

New engineering books

RAILROAD ENGINEERING, Volume I—By William W. Hay. 483 pp. John Wiley & Sons, 440 Fourth Ave., New York 16, N. Y. $7.50. $8.25 in Canada.

INTRODUCTION TO ENGINEERING ECONOMY—Second Edition—By Baldwin M. Woods and E. Paul DeGarmo. 519 pp. The Macmillan Company, 60 Fifth Ave., New York 11, N. Y. $6.00.

ENGINEERING DRAWING—By Frank Zozzora. 369 pp. McGraw-Hill Book Co., 330 West 42nd St., New York 36, N. Y. $5.00.

STEEL RIGID FRAMES—MANUAL—DESIGN AND CONSTRUCTION—By Martin P. Korn. 170 pp. J. W. Edwards, Inc., Ann Arbor, Mich. $4.50.

Experience
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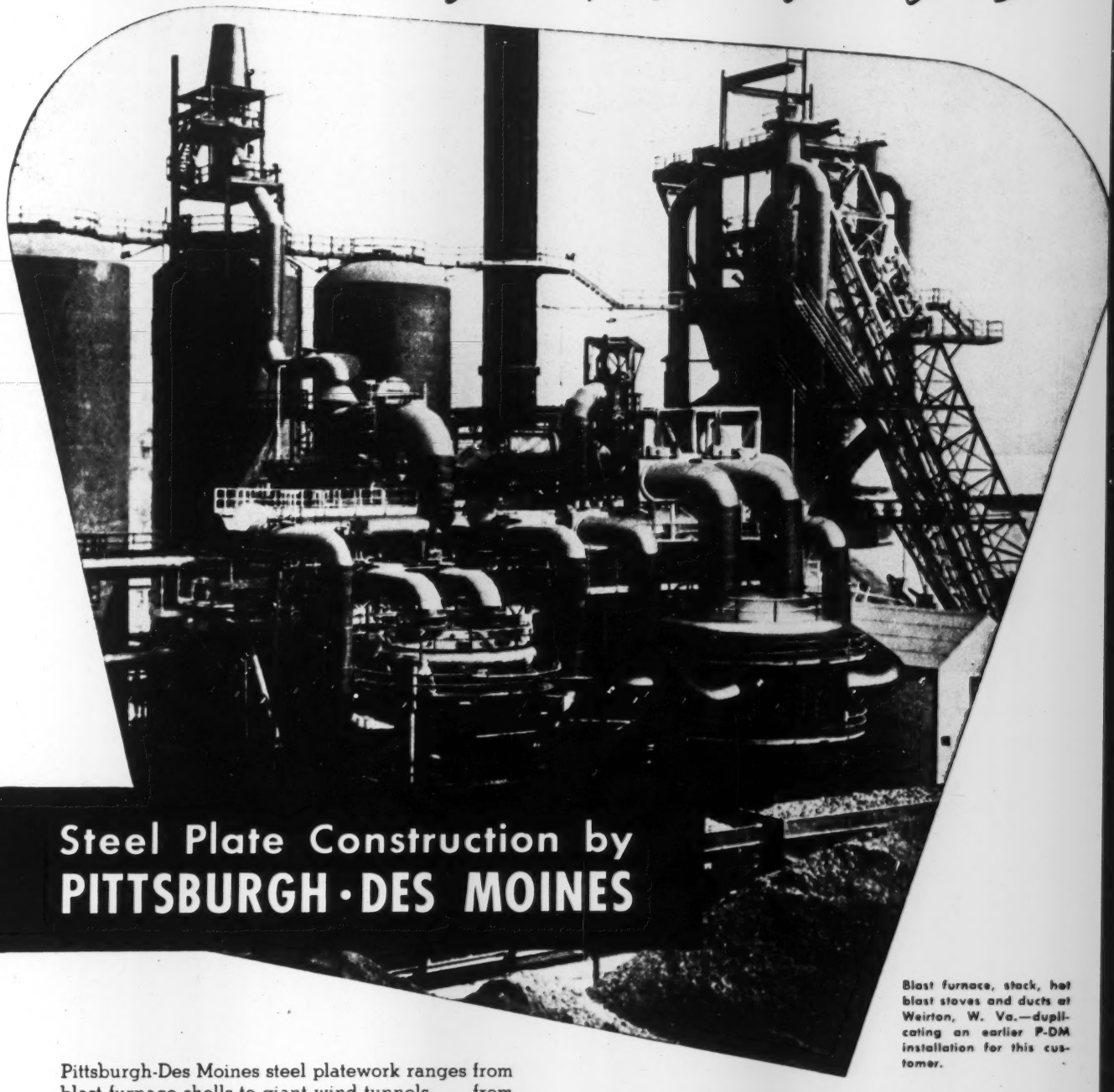

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6358

ENGINEERS AND BUILDERS OF OIL HYDRAULIC EQUIPMENT SINCE 1921

OBITUARIES

Thomas P. Fitzgerald, 81, Ashtabula, Ohio, former president of the Fitzgerald Construction Co., and former owner of the Redi-Mix Concrete Co., died Aug. 19. He built hundreds of miles of roads in Ashland County, Ohio.

F. A. Hubbell, Sr., 64 Atlanta, Ga., structural engineer, died Aug. 20. He was a University of Michigan graduate. He created the structural design of several well known Atlanta buildings and other buildings in various sections of the Southeast.

Charles C. Mangum, 69, a leading grading contractor and road builder in North Carolina, died at Raleigh Aug. 25.

Asbestos fibers from pipe insulation reclaimed

Simple, effective procedures for reclaiming asbestos from discarded pipe insulation have been developed by E. W. Zimmerman of the National Bureau of Standards. Extraneous material is removed from the asbestos cloth by chemical treatment, and the cleaned cloth is reduced to fiber form in a paper-pulp beater. The recovered asbestos is unchanged chemically with little or no shortening of the fibers, and it appears well suited to further use as electrical and thermal insulation, for making asbestos paper and as a filler in molded plastic compounds.

Insulation containing glass fibers was only partially recovered, and even the reduced end product was contaminated with glass strands. Similarly, molded insulation using magnesia cement as a binder yielded only 15% of the fiber and this was highly contaminated with foreign materials.

Survey Snake River dams

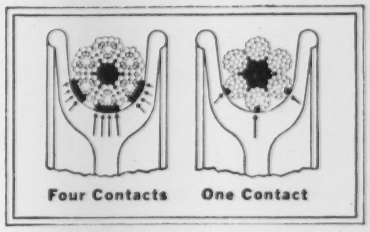
New surveys of eight sites for multipurpose dams on the middle Snake River basin in Idaho have been authorized by the Corps of Engineers. All sites—on the Snake itself, the Salmon, and Clearwater rivers—involve large storage factors vital to flood control and downstream power generation.

Prestressing course

Brooklyn Polytechnic Institute is planning a new graduate course in prestressed concrete, under the supervision of Prof. Odd Albert. The course will start with the fall semester.

Engineer answers vital questions about the strongest wire rope made—Flattened Strand

What is Hercules® flattened strand wire rope? Why does it outperform round strand rope by 2 to 1 or more? Can you use it? Walter C. Richards, chief engineer, Leschen Wire Rope Division, tells you the answers.



With Flattened Strand, notice how four wires per strand contact sheave grooves —reducing rope and equipment wear.

More and more wire rope users are continually experiencing or hearing about spectacular performances of Hercules Flattened Strand wire rope. The explanation is clear.

First, Hercules Flattened Strand is a Super-rope because it packs 10% more steel than any round strand rope of the same size. It's 10% stronger... 10% safer.

Second, Hercules Flattened Strand wears longer and more evenly. That's because there are four wires per strand contacting sheave grooves instead of one.

Third, Hercules Flattened Strand resists crushing and internal strand-cutting, because strands rest snugly against each other, keystone fashion, with less internal pressure or friction.

Fourth, Hercules Flattened Strand prolongs its own life and the life of equipment, because the relatively smooth surface of the rope prevents corrugating and wear on sheave grooves.

Can you use it?

It's a known, proved fact that no other wire rope made can equal Flattened Strand on applications such as hot ladle cranes, skip hoists, and dredge ropes. It is also best on a variety of other equipment both large and small. For many uses, it is truly a Super-rope.

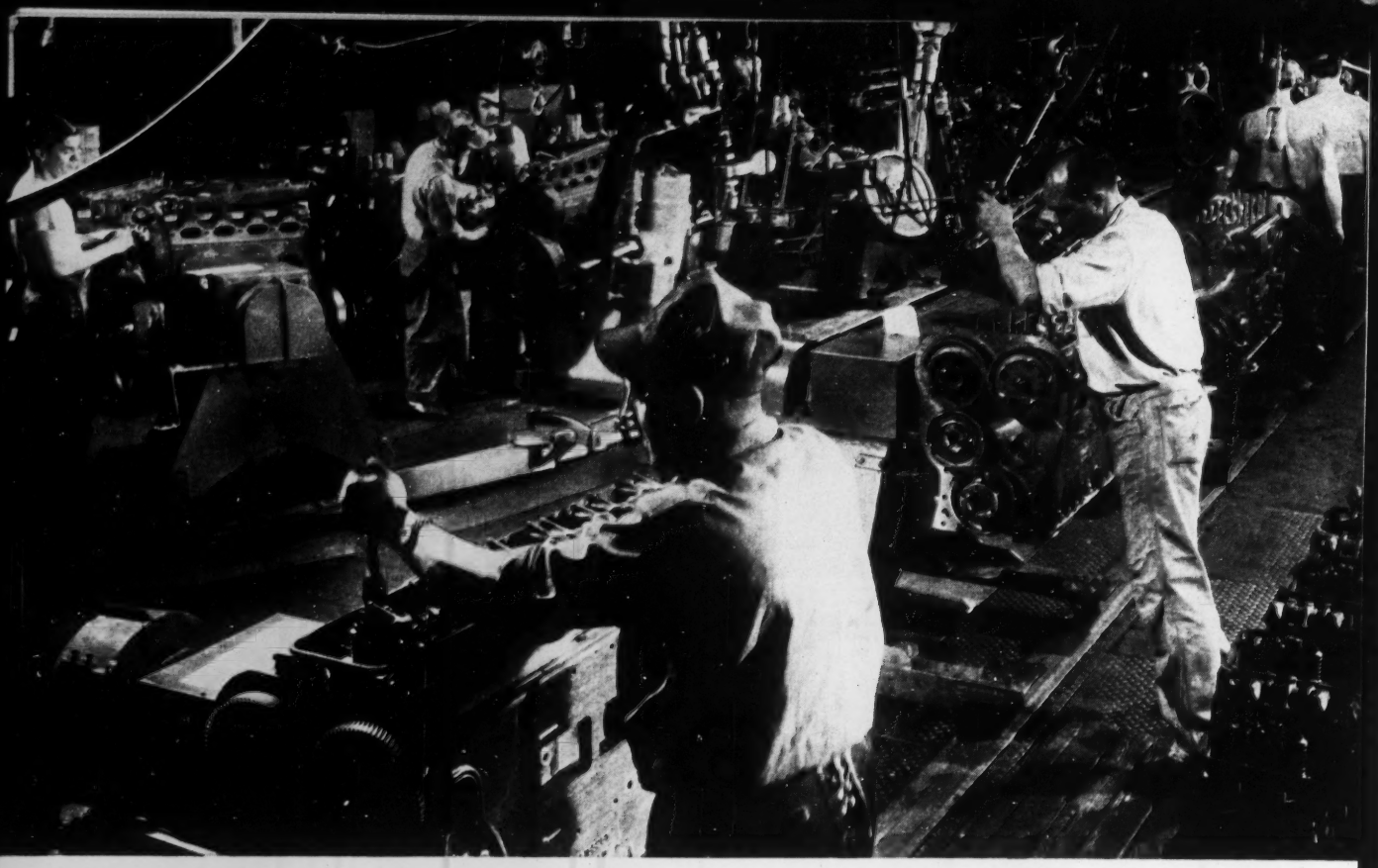
But, the question is, can *you* use it to advantage? That can be answered only by a qualified wire rope engineer who is thoroughly acquainted with the characteristics and proper uses of Flattened Strand rope.

Check with the authority

That means, check with Leschen. It's wise to do so because Leschen pioneered and perfected Flattened Strand wire rope. Leschen developed special machines to make it. Leschen conducts continuing research on correct uses. Leschen is the authority.

If you discover you can use this Super-rope—Hercules Flattened Strand—you'll soon begin saving time, labor and money. Why not investigate *now?*

LESCHEN WIRE ROPE DIVISION · ST. LOUIS 12, MISSOURI
The Watson-Stillman Company
(A SUBSIDIARY OF H. K. PORTER COMPANY, INC.)



Key to Low-Cost Horsepower is efficient, economical mass production. Basic GM Diesel engines are built up on this modern assembly line. The engines are then transported automatically by overhead cranes to the dynamometer room for testing and run-in. Some then go to other lines where engine bases and accessories are added and multiple-engine units are assembled. All GM Series 71 engines have the same size bore and stroke—thus many parts are standardized and interchangeable from a 2-cylinder engine to a 24-cylinder 840 H.P. "Quad."

Inside Reasons Why GM Diesel Gives You Lowest-Cost Horsepower

If you were to visit the Detroit Diesel plant you'd see reasons for the widespread acceptance of General Motors Diesel engines—reasons why these engines today power more than 750 different models of equipment.

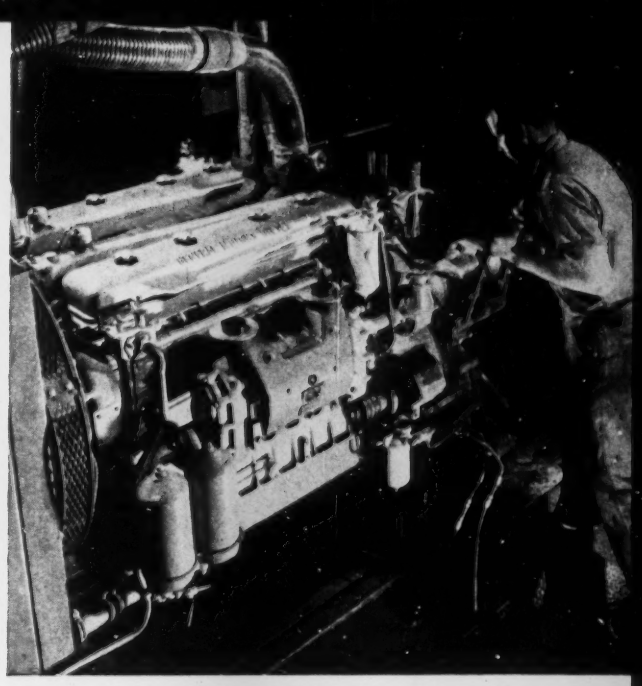
The inside story of GM Diesel is *quality*—quality that starts with the unmatched simplicity of GM Diesel's 2-cycle design—quality that comes from continuous research and constant improvements by GM engineers—quality assured by precision manufacturing methods and checked by the most rigid tests at every stage of production.

To users, it means reliable Diesel power at the *lowest cost per horsepower hour*—lower initial cost, lower parts cost, lower maintenance cost.

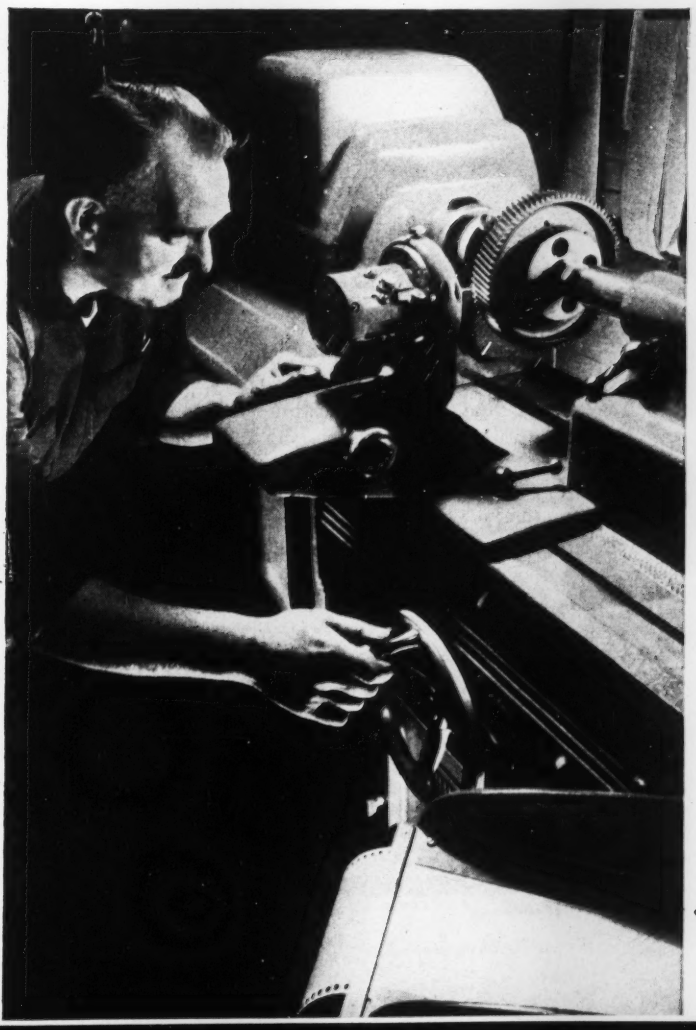
DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN

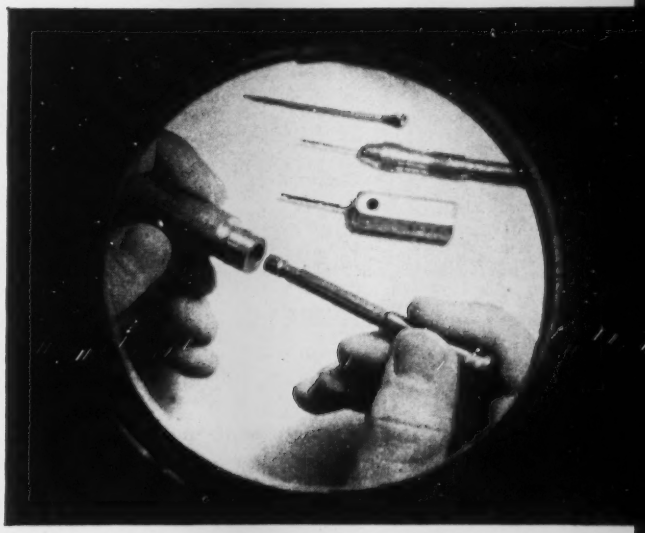
Precision Inspections are made at many points along the line in the production of a GM Diesel engine. These men are using dial gauges to check exact location of the flywheel housing with relation to the crankshaft flange before mounting the engine flywheel.

Final Piston Inspection—Using a weighing scale, "black light" magnetic inspection and numerous precision gauges, this veteran inspector carefully rechecks each and every GM Diesel engine piston. "Quality Control" like this is a good reason for standardizing on *both* GM Diesel engines and *genuine* GM Diesel parts.



"Twin" Test—GM Diesel "Twin" being given final test on typical dynamometer test stand to assure that it delivers specified horsepower. Each of the two engines in the "Twin" has already undergone basic dynamometer testing, but all multiple engine units, generator sets, and power units receive this additional final test.





30 to 60 Millionths of An Inch clearance between injector plunger and bushing. Operator looks through magnifying glass to assemble two perfectly mated parts which work as a pair for life. The working area is completely air conditioned to protect the assembly from foreign particles.

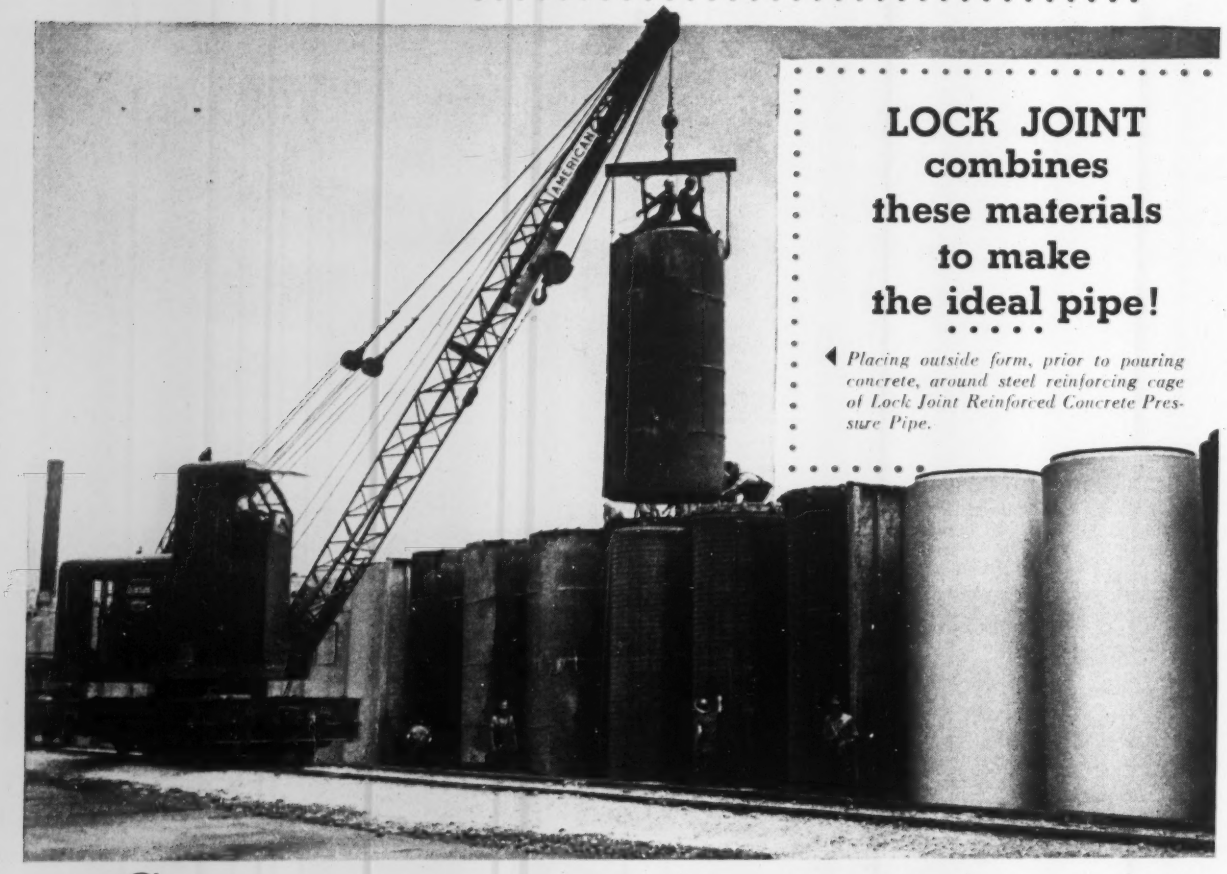
It pays to STANDARDIZE on

GM
GENERAL MOTORS
DIESEL POWER

Single Engines . . . 16 to 275 H.P.
Multiple Units . . . Up to 840 H.P.

Gear Inspection—On this instrument the profile of gear teeth is regularly inspected and electrically recorded on a tape. Other machines in the gear inspection room check all operating characteristics of our all-steel gears to assure smooth running and maximum life.

There's no substitute for CONCRETE and STEEL!



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Placing outside form, prior to pouring concrete, around steel reinforcing cage of Lock Joint Reinforced Concrete Pressure Pipe.

CONCRETE, with its proven qualities of durability, non-corrosion, resistance to electrolytic action, and high compressive strength is combined, by Lock Joint, with steel's toughness, resilience and high tensile strength to make a pipe that retains the best qualities of both—non tuberculance, high structural strength and long life with little or no maintenance. Dense concrete affords complete protection for the quality reinforcing steel. Both materials are carefully calculated to meet your pressure needs with a wide factor of safety. The Lock Joint Pipe Company's Rubber and Steel Joint is extremely watertight and, at the same time, flexible.

For superior strength, carrying characteristics and trouble-free operation, let Lock Joint supply your pipe needs in sizes 16" and larger.

SCOPE OF SERVICES—*Lock Joint Pipe Company specializes in the manufacture and installation of Reinforced Concrete Pressure Pipe for Water Supply and Distribution Mains 16" in diameter or larger, as well as Concrete Pipes of all types for Sanitary Sewers, Storm Drains, Culverts and Subaqueous Lines.*

LOCK JOINT PIPE COMPANY

Established 1905

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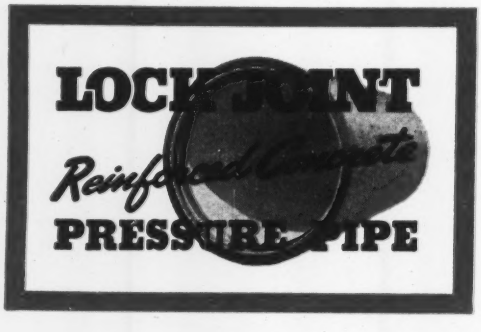


CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded—First Section—

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 36, N. Y., ELSIE EAVES, Manager
J. A. MAHONEY, M. O. WETZEL, L. M. WINISKI, M. E. SCIORRA, F. S. DEMBEK, Reports.
J. H. WEBBER, M. R. ROESSLER, E. R. HUBER, Statistics.

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

† **Conn.,** Waterbury—B.A. 9/15—Dist. P. Wks. Office, Third Naval Dist., Federal Office Bldg., 90 Church St., New York, 7, N. Y., replace domestic hot water piping at U. S. Naval Reserve Training Center, Spec. 39133 (SF).

Mass., Lynn—B.A. 9/29—City, City Hall, constr., install 16 in. transmission main, appurtenances, $35,000. Plans deposit $15, refundable. Morris Knowles, Inc., 1312 Park Bldg., Pittsburgh, Pa., engr.

BIDS ASKED—BUILDINGS

▲ **Conn., West Hartford**—SCHOOL—B.A. 9/22—Town, Dr. Edward H. Thorne, supt. Schools, Memorial Rd., elementary school and Junior High School, King Philip Dr. $3,500,000. Plans deposit $100. Extended date. Ebbets-Frid & Prentice, 862 Asylum Ave., Hartford, archts. CD 8/27.

▲ **Mass., North Adams**—HOSPITAL—B.A. 10/1—At office Leland & Larsen, archts., 814 Statler Blvd., Boston, (selected list bidders) 3 story, bsmnt., masonry hospital near present bldg. on Hospital Ave., for North Adams Hospital Inc., H. B. Clark, pres., Hospital Ave., North Adams, Mass. $1,850,000. Plans deposit $50, refundable. CD 1/13.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **Jefferson Constr. Co.,** 75 First St., Cambridge, Mass. LB $413,000, est. $400,000. facilities, Limestone Air Force Base, ENG-19-016-54-10, LIMESTONE, ME. U. S. Eng., 857 Commonwealth Ave., Boston, Mass. Bids Aug. 25. CD 7/29.

MASSACHUSETTS—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,

E. T. O'Neill & Son Constr. Corp., 223 Commercial St., Holyoke, Mass. LB $62,401, est. $63,000. hy. work Dale St., Chicopee. Bids Aug. 25. CD 8/14.

BUILDINGS

LOW BIDS AND CONTRACTS

Swanson-Janson Co., 82 Foster St., Worcester, Mass. CA Est. $160,000. 2 FACTORY addns., 72 Cross St., WORCESTER, MASS. Loring Coes Co., 72 Coes St., Worcester, Mass. Bids June 19. D 6/16.

▲ **J. J. McHale & Sons, Inc.,** 101 Ferris St., Pawtucket, R. I. Owner Builds. $2,500,000. SHOPPING CENTER, 21 bldgs. off Newport Ave., EAST PROVIDENCE, R. I. CD 9/9/52.

Arthur A. Canzler, Padanaram Rd., Danbury, Conn., LB, $777,199, elementary SCHOOL Pickett Dist. Site, NEW MILFORD, CONN. Bd. Educ., Town Hall, New Milford, Conn. Bids Aug. 25. CD 8/10.

Beaudry Constr. Co., 142 Hancock St., Springfield, Mass., CA, $578,688, elementary SCHOOL, East St., ROCKVILLE, CONN. Town, Vernon School Bldg. Comn., Rockville, Conn. Bids Aug. 18. CD 8/27, under LB.

▲ **E. & F. Constr. Co.,** 94 Wells St., Bridgeport, Conn., CA, $832,000, HIGH SCHOOL, off Perry Rd., SHELTON, CONN. City School Dpt., City Hall, Shelton, Conn. Bids Aug. 11. CD 8/18, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

N. Y., New York—B.A. 9/14—President of Borough of Manhattan, Municipal Bldg., Zone 7, Contract No. 136, Harlem River Drive Improvement, E. 125 St. to Harlem River Driveway, bulkhead wall and fill marginal street from a point about 80 ft. south of south building line, on Lexington Ave. to point about 50 ft. north of south building line of E. 133 St. prolonged, together with all work. Plans deposit $25.

New York—GAS and COMFORT STATION—B.A. 9/17—Henry A. Cohen, dir., Bureau Contracts & Accounts, Dpt. P. Wks., The Governor Alfred E. Smith State Office Bldg., Albany, gas and comfort station Taconic State Parkway, Section 9A, Town of Taghkanic, Columbia Co. Plans deposit $10.

PENNSYLVANIA—B.A. 9/18—State Hy. Dpt., North Office Bldg., State Capitol, Harrisburg,

Bucks Co.—bit. on crusned aggregate surf., 24 ft. wide, 1 rein.-con. arch bridge also rein.-con. bridge 14,855 ft. L.R. 09018 (2), Middletown Falls Twps., Plans deposit $10.

Indiana Co.—bit. on crushed aggregate surf., 22 ft. in width, incl. 2 rein.-con. boxes exten. of existing bridge and bit. surf. for paving railroad crossing, 20,638 ft. L.R. 32035 (R-1) 32036 (Spur E) 32036 (R-3), Center, Brush Valley, White Twps., F.A. Secondary Proj., Plans deposit $12.50.

Lycoming Co.—c. conc. 24 ft. 36 ft. in width, incl. rein.-con. box, two I-beam bridges one rein.-con. bridge and crushed aggregate base with bit. surf. 6 ft. 4 in. variable width, L.R. 20 (21) T.R. 14-15, Hepburn, Lewis Twps., Plans deposit $12.50.

Westmoreland Co.—bit. on crushed aggregate surf., 18 ft. width, wid'n. existing pavement with crushed aggregate base 3 ft. variable width, bit. surf. base and existing pavement 18 ft. width, bit. surf. existing pavement 22 ft. variable width and bit. surf., railroad crossing 3,063 ft. L.R. 64152 (1), Unit Twp., Plans deposit $5.

York Co.—bit. on crushed aggregate surf., 22 ft., 20 ft. variable in width incl. 4 rein.-con. structures, I-beam bridge, 28,885 ft. L.R. 124 (2), 66006 (2), T.R. 74, Dover, Boro, Dover and Warrington Twps., F.A. Secondary Proj., Plans deposit $15. E. L. Schmidt, secy. Hys.

† **New Jersey**—B.A. On or About 9/22—U.S. Eng., 80 Lafayette St., New York 13, N. Y., dredging to depths of 25 and 18 ft. below mean low water in south and main channels, respectively of Raritan River, Serial No. CIVENG 30-075-54-6.

BIDS ASKED—BUILDINGS

▲ **Pa., Chester**—HIGH SCHOOL—B.A. 9/15—Roman Catholic Diocese, 310 N. 19 St., Phila., St. James High School addn. $1,000,000. Stickle & Assoc., 2422 Prospect St., Cleveland, O., archts.

N. Y., Brooklyn—LIBRARY—B.A. 9/16—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, rehabilitation and reconstruction of Williamsburg Regional Branch Library, Marcy and Division Aves., Contract No. 1, general construction work; Contract No. 2, plumbing work, Contract No. 3, heating and ventilating work; Contract No. 4, electrical work and lighting fixtures. Plans deposit $25.

▲ **Pa., Harrisburg**—OFFICE—B.A. 9/16—General State Auth., 18 and Herr Sts., office bldg., garage and warehouse, $1,250,000. Clayton J. Lappley, 1519 W. Front St., archt. CD 8/5.

N. J., North Plainfield—SCHOOLS—B.A. 9/17—Bd. Educ., North Plainfield, East and West End Schools addns., alterations, $300,000. CD 10/3/45.

N. J., Florham Park—SCHOOL—B.A. 9/22—Bd. Educ., Boro of Florham Park, elementary school. $500,000.

N. Y., New York—OUT PATIENTS DEPARTMENT—B.A. 9/23—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, new outpatient department addn., existing department alterations, new garage, storehouse, Lincoln Hospital E. 141 St. and Wales Ave., Bronx Boro, Contract No. 1, general construction work; Contr. No. 2, plumbing work; Contr. No. 3, heating and ventilating; Contr. No. 4, electrical work and lighting fixtures. Plans deposit $50. CD 8/19. Extended date.

† **D. C., Wash.**—POWER PLANT—B.A. 9/24—U.S. Eng., First and Douglas Sts. N.W., power plant at U.S., Soldiers Home, CIVENG 49-080-54-1. Extended date. CD 8/12.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Tufano Constr. Corp., 32-17 Lawrence St., Flushing, N. Y., LB, $117,516, pavement adjacent to operations bldg. Contract NYA 350.001. New York International Airport, IDLEWILD, N. Y. The Port of New York Auth., 111 Eighth Ave., New York 11, N. Y. Bids Aug. 25.

† **John J. Harvey Co. Inc., P.O.** Box 371, Utica, N. Y. CA $64,502, receiver bldg. and radio transmitter bldg. addn. Griffiss Air Force Base, AN/GRC-27, ROME, N. Y. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Aug. 13. CD 7/2.

▲† **Charles Simkin & Sons,** 130 Patterson St., Perth Amboy, N. J., CA, $3,381,026, central heating plant, distribution system and paving, McGuire Air Force Base, 36-109-53-427, WRIGHTSTOWN, N. J. U. S. Eng., 121 N. Broad St., Phila., Pa. Bids June 23. CD 7/16, under LB.

▲ **A. Wikstrom, Inc.,** Skaneateles, N. Y., LB $1,649,636 underpass; LB $228,790, trunk sewer, East Capitol St. under 19 tracks, Pennsylvania and Baltimore & Ohio RR., WASH., D. C. D. C. Govt., Director Hys., 499 Pa. Ave. N.W., Wash., D. C. Bids Aug. 26. CD 8/14.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Psaty & Fuhrman,** 369 Lexington Ave., New York 17, N. Y., CA. Est. $1,000,000. Donnell Free LIBRARY and READING ROOM, 20-30 W. 53 St., NEW YORK, N. Y. New York Public Library, 476 Fifth Ave., New York 36, N. Y. Bids June 26. CD 6/4.

Turner Constr. Co., 1500 Walnut St., Phila., Pa., CA, $500,000, GARAGE, ATLANTIC CITY, N. J. Marlborough-Blenheim Hotel, Park Pl. and Boardwalk, Atlantic City, N. J. George M. Ewing, Western Saving Fund Bldg., Phila., Pa., archt.

▲ **Gottlieb Schneider,** 1434 Monocacy St., Bethlehem, Pa. CA, $1,380,000. Consolidated HIGH SCHOOL, COOPERSBURG, PA. Southern Lehigh School Dist., Coopersburg, Pa. Bids July 15. CD 8/3, under LB.

Henry Shenk Co., 1117 Sassafras St., Erie, Pa. CA Est. $314,589. 1 story, brick, block GRADE SCHOOL near ERIE, PA. Green Twp. School Auth., RD 5, Erie, Pa. Wm. Holmes Crosby, 49 Maple Ave., Oil City, Pa., archt. CD 6/11.

▲ **Roger Constr. Co.,** Liberty Trust Bldg., Phila., Pa. Separate Contracts. $2,500,000. RESIDENTIAL DEVELOPMENT, Horsham Twp., HATBORO, PA.

▲ **Algernon Blair Co.,** First National Bank Bldg., Montgomery, Ala. CA $40,000,000. RESIDENTIAL DEVELOPMENT, on 450 acre tract consisting 1,198 garden type apartments, 528 triple attached bldgs., 866 semi-detached apartments, 164 single homes, shopping center, LANDOVER, MD. Frank Constr. Co., 1923 L St. N.W., Wash., D. C., Pierre Ghent & Assoc., 1836 Jefferson Pl. N.W., Wash., D. C., engrs. Pearson, Tittle & Narrows, First National Bank Bldg., Montgomery, Ala., archts.

Avery Constr. Co., 629 F St. N.W., Wash., D. C. LB $324,877. BANKING and OFFICE, SILVER SPRING, MD. Citizens Building & Loan Assoc., Pershing Dr. and Fenton St., Silver Spring, Md. Bids Aug. 25. CD 7/2.

William P. Lipscomb, Woodward Bldg., Wash., D. C., LB $354,780, CHURCH, WASH., D. C., St. Peters Lutheran Church, Michigan Ave. and Webster St. N., Wash., D. C. Bids Aug. 24. CD 7/28.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

Fla., Tampa—B.A. 9/22—City, City Hall, Contract 2 Parts A and B, water filtration plant addn., over $200,000. Plans deposit $50. Robert & Co. Assocs., 96 Poplar St. N.W., Atlanta, Ga., engrs. CD 11/8/51.

S. C., Florence—B.A. 9/23—City, storm sewers, $250,000, Harwood Beebe Co., Montgomery Bldg., Spartanburg, engrs. CD 2/17.

† **N. C., Wilmington**—SITE RAILROAD—B.A. 9/24—U. S. Eng. 308 Customhouse, site railroad, Wilmington Ammunition Loading Terminal, Sunny Point, Eng-31-075-54-2. CD 7/31.

BIDS ASKED—BUILDINGS

Ky., Covington—SCHOOL—B.A. 9/16—Diocese of Covington, Madison Ave., school, Dixie Hy. near Old State Rd. $750,000. Betz & Bankemper, 132 Morris Rd., Lookout Heights, engrs-archts. CD 1/16.

Ky., Newport—SCHOOL—B.A. 9/16—Diocese of Covington, Madison Ave., Newport High School overlooking 12 and Monmouth Sts. $750,000. Betz & Bankemper, 132 Morris Rd., Lookout Heights, engrs.-archts. CD 2/26.

Miss., State College—ALUMNI—B.A. 9/16—State Bldg. Comn., Jackson, alumni bldg. at Mississippi State College, $300,000. Extended date. CD 8/26.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

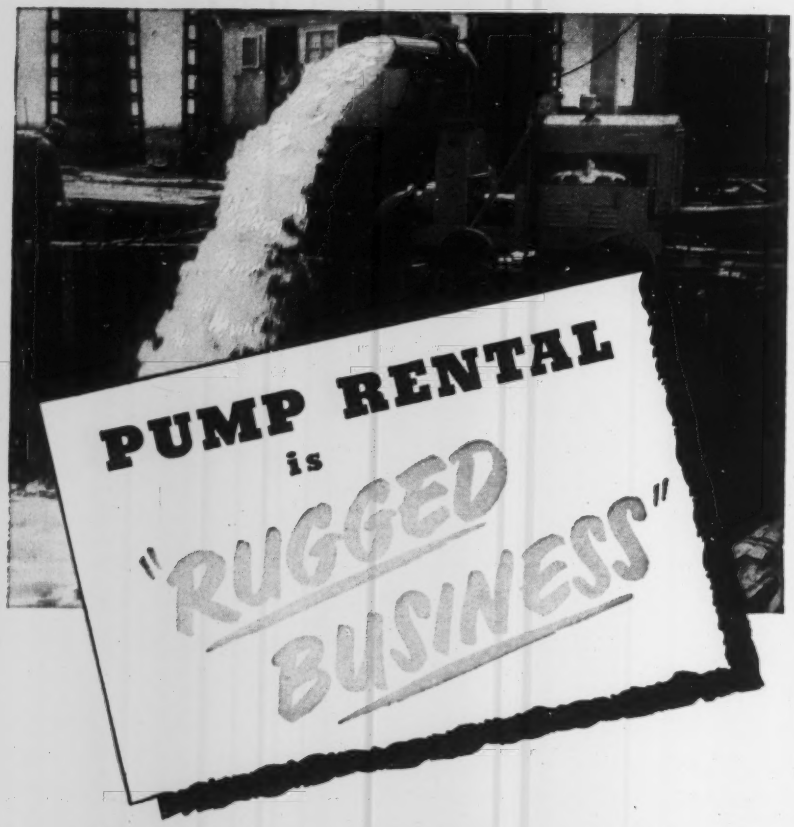
LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects inviolved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily



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Ga., Waynesboro—SCHOOL—B.A. 9/24—Burke Co. Bd. Educ., Waynesboro, high school, $500,000. Plans deposit $50.

Ga., Conyers—HOSPITAL—B.A. 9/27—Rockdale Co., Court House, hospital. Stambaugh & Jett, Rhodes Bldg., Atlanta, archts.

Va., Richmond—WAREHOUSE—Bids Asked—Commercial Properties, Inc., c/o Joseph Mass, Mass-Maloney Corp., 295 Wash. St., Boston, Mass., 1 story, 56,000 sq. ft. warehouse consisting storage, office and showroom space.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

G. E. Moore Co., Greenwood, S. C. LB **$254,391**, Part 2; Howard Constr. Co., Greensboro, N. C. LB $284,992. Part 1. sewer, DRAPER, N. C. Town, Draper, N. C. Bids Aug. 18. CD 7/30.

G. E. Moore Co., Greenwood, S. C. LB **$288,060**, Part 1, LB **$282,635**, Part 2. WW sys., DRAPER, N. C. Town, Draper, N. C. Bids Aug. 18. CD 7/30.

Walker Plumbing & Heating Co., Greenville, S. C. LB **$69,700**. steam distr. sys., MORGANTON, N. C. State School for Deaf, Morganton, N. C. Bids Aug. 18. CD 8/10.

FLORIDA—State Rd. Dpt., Tallahassee.
H. E. Wolfe Constr. Co., St. Augustine, Fla., CA, **$517,886**, grading, stab., paving, small drainage structures, tc. State Rd. 50, Colonial Dr. in Orlando, Job 7506-203, FAP U 022-1 (1), Orange Co. Bids June 30. CD 7/16, under LB.

▲† **J. Hilbert Sapp, Inc.**, Orlando, Fla., CA, **$1,772,439** BARRACKS and MESS HALL, NOY 71532, Cecil Field JACKSONVILLE, FLA. Dpt. Navy, P. Wks. Officer, Naval Base, S. C. Bids Aug. 26. CD 7/29.

ALABAMA—State Hy. Dpt., Montgomery,
Moss-Thornton Co., Box 127, Leeds, Ala., CA, **$667,162** grading, paving 6.184 mi. Jasper-Birmingham Road, Proj. F-24 (3) and 350 (4), Walker Co.;
B. F. Williams Constr. Co., Box 188, Ozark, Ark., CA, **$81,979**, FA-S-623 (1), Geneva Co.;
L. J. Cousins, 56 S. Lewis St., Montgomery, Ala., CA, **$64,014**, SACP-3128-A, Chilton Co. Bids Aug. 7. CD 8/31, under LB.

ALABAMA—State Hy. Dpt., Montgomery,
Cohron Constr. Co., 356 Cohron Ave., Mobile, Ala., LB, **$81,965**, bridge 0.056 mi. over Gurley Creek FA-S-448 (2), Jefferson Co. Bids Aug. 7. CD 7/29.

▲ ALABAMA—State Hy. Dpt., Montgomery
O'Dell Constr. Co., 326 Old South Life Bldg., Montgomery, Ala., LB, **$213,128**, 7.865 mi. SACP-321-C, Pickens Co.; LB **$81,888**.
J. W. Gwin, Jr., Inc., 1803 Comer Bldg., Birmingham, Ala., LB **$73,905**, 3.001 mi. Proposal "A" FA-S-485 (L) Colbert Co.; LB **$67,017**, 6.438 mi. FA-S-503 (3) Dekalb Co.;
Hooper Constr. Co., Box 4471, Coral Gables, Fla., LB **$172,481**, 7.021 mi. FA-S-42 (2), Clarke Co.;
Ledbetter-Johnson Co., Box 1067, Rome, Ga., LB, **$160,792** 9.061 mi. F-S-88 (2), Talladega Co.;
Laidlaw Contg. Co., 2557 Durham Dr., Mobile, Ala., LB, **$447,678**, 11.627 mi. F.I.-163 (4) and 226 (4), Baldwin and Escambia Counties;
M. A. Evans Constr. Co., Rt. 1, Wetumpka, Ala., LB, **$71,513**, 8.103 mi. FA-S-238 (3), Tusaloosa Co.;
L. J. Cousins, 56 S. Lewis St., Montgomery, Ala., LB, **$83,559** 5.23 mi. Proposal "A", FA-S-319 (2) and 372 (3), Washington Co.;
J. B. Maynard, Alexander City, Ala., LB, **$61,445** 6.106 mi. FA-S-625 (1), Tallapoosa Co.;
Dunn Constr. Co., 2508 3 Ave. N., Birmingham, Ala., LB, **$99,442**, 10.217 mi. FA-S-557 (1) and SACP-261-A (2) Etowah Co.;
Tillett Bros. Constr. Co., Shelbyville, Tenn., LB **$158,507** 3.505 mi. Proposal "A" FA-S-567 (2), Cullman Co.;
G. & R. Coal Co., Box 286, Robbins, Tenn., LB **$175,992** 14.905 mi. SACP-1105-A, Morgan Co.; cancelled bids to have been opened Aug. 7, FAS-36 (6) St. Clair Co. Bids Aug. 7. CD 7/29.

Southeastern Mfg. Co., 2430 Greensboro Ave., Tuscaloosa, Ala., CA, **$64,000**, swimming pool and bath house, EUTAW, ALA. City, City Hall, Eutaw, Ala. Bids Aug. 2. CD 8/12.

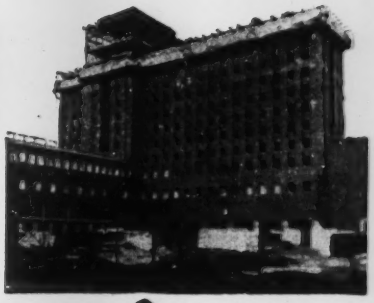
Brock & Blevins, Rossville, Ga., LB, **$297,319** sewage disposal plant, PRICHARD, ALA. City, City Hall, Prichard, Ala. Bids Aug. 25.

Sullivan, Long & Hagerty, 2026 2 Ave., Bessemer, Ala., CA, **$751,615**, sanitary sewers, PRICHARD, ALA. City, Prichard, Ala. Bids Aug. 24. CD 8/28, under LB.

MISSISSIPPI—State Hy. Dpt., T. C. Robbins, dir., Jackson,
R. B. Tyler Co., 1446 Levering St., Louisvile, Ky. CA **$172,437**, est. $171,800. base preparation, double bit. surf. tr. 8.355 mi. Miss. Hy. No. 32 between Miss. Hy. No. 1 and U.S. Hy. No. 61, Proj. S 0601 (3) A, Bolivar Co.;
Dickerson & Bowen, Brookhaven, Miss. CA **$136,376**. est. $136,000. alternate types of base and double bit. surf. tr. 5.485 mi. Miss. Hy. No. 8 between Ruleville and Minter City, Proj. F 016-1 (2), Sunflower Co.;
Burdine Constr. Co., Greenville, Miss. CA **$138,023**, est. $132,000. c. conc. 0.762 mi. U.S. Hy. No. 82 and 49-E between Greenwood and Fort Pemberton, Proj. 008-5 (7), Leflore Co. Grand total $446,835. Bids Aug. 25. CD 8/14.
John H. Walsh & Co., P.O. Box 1106, Grenada, Miss. LB $38,550. channel excav., Carroll and Grenada Counties, AVALON, MISS. Potacocowa Creek Drainage Dist., Avalon, Miss. Bids Aug. 22. CD 8/11.

continued on page 113

MODEL 450 REMINGTON STUD DRIVER



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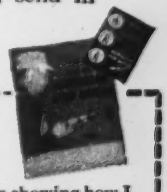

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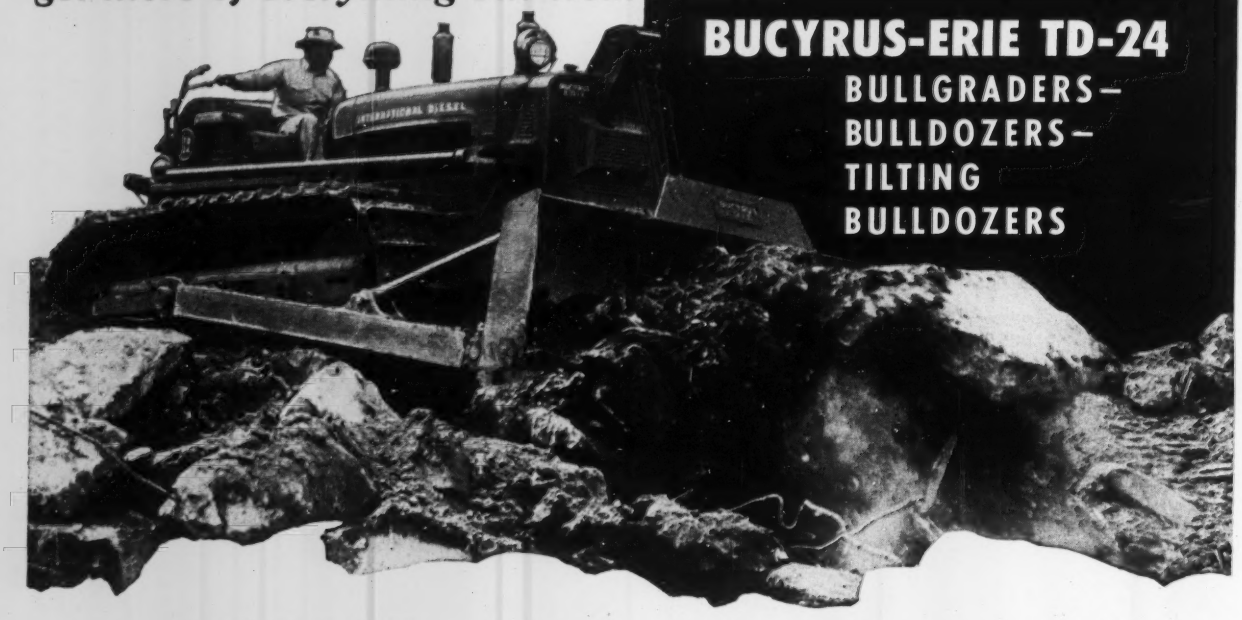

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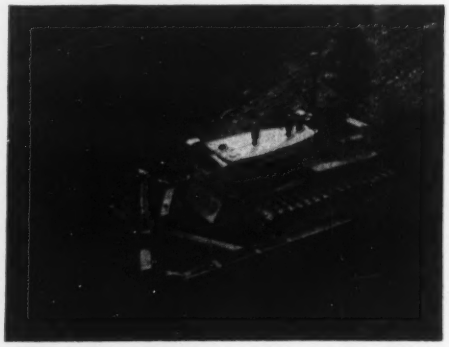

(Continued from page 110)

† **U. S. Eng.,** 300 Broadway, Little Rock, Ark. cancelled bids to have been opened Aug. 20, Stage II of lighting sys., Alexandria Air Force Base, Inv. 54-2, ALEXANDRIA, LA. CD 7/28.

Kelly-Generes Constr. Co., 2120 Senate St., New Orleans, La. LB $117,455. imprv. Soniat Canal, NEW ORLEANS, LA. Fourth Jefferson Drainage Dist., 648 Helois St., New Orleans, La. Bids Aug. 21. CD 8/12.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort,

Lyons & Breeden, Rogersville, Tenn. LB $69,584. bridge, bit. surf. Class C-1 0.492 mi. Mt. Sterling-Hope Rd., S 499 (1), RS 87-217, Montgomery Co. Bids Aug. 21. CD 8/6.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort,

Fount Crew Ltd., Beaver Dam, Ky. LB $116,500. traffic bound limestone 2.672 mi. Lockport-Fallis Rd., S 523 (1), RS 52-527, RS 52-627, Henry Co.;

McDade & McDade, Fulton, Ky. LB $72,514. local bank or creek grav. 4.124 mi. Folsomdale-Symsonia Rd., S 463 (1), SP 42-238, Graves Co.;

Talbott-Myers Constr. Corp. & Talbott-Tobin Contg. Co., Winchester, Ky. LB $871,958. traffic bound surf. 14.024 mi. Gilbertsville-Paducah Rd., F 530 (7) SP 79-653, SP 79-393, SP 73-432, Marshall and McCracken Counties.

M. T. Codell Co., Inc., Winchester, Ky. LB $138,981. traffic bound limestone 4.166 mi. Elam Store-Wheelersburg Rd., S 157 (2), SP 88-58, SP 77-160, Morgan and Magoffin Counties;

State Contg. & Stone Co., Hartford, Ky. LB $69,259. bit. surf. Class I 6.692 mi. Hartford-Centertown Rd., SP 92-224, Ohio Co.;

Adams Constr. Corp., Paintsville, Ky. LB $114,560. 3 in. bit. macad. surf. (penetration type) slag aggregate 9.822 mi. Wayland-Beaver Gap Rd., SP 60-38, Knott Co.;

Blackburn & Ferguson Contg. Co., Fredonia, Ky. LB $61,860 reconstr., traffic bound limestone 3.963 mi. Dycusburg-Fredonia Rd., RS 28-486, Crittenden Co.;

Corum & Edwards, Madisonville, Ky. LB $61,264. bit. plant mix Class F 10.7 mi. Marion-Shady Grove Rd., SP 28-46 and Marion-Elizabethtown-Ferry Rd., SP 28-146, Crittenden Co. Bids Aug. 21. CD 8/6.

J. M. Hammer Co., 1608 Russel St., Covington, Ky. LB $218,800, est. $225,000. 50x257 ft., brick, steel cargo bldg., Greater Cincinnati Airport, Airport Rd., Boone Co., ERLANGER, KY. Kenton Co. Airport Bd., Airport Rd., Erlanger, Ky. Abner Foster, Sixth and Greenup Sts., Covington, Ky., archt. Landrum & Brown, 111 E. 4 St., Cincinnati, O., engrs.

R. D. Cole Mfg. Co., Newnan, Ga. CA $43,485. water storage tank, SOMERVILLE, TENN. City, Somerville, Tenn. Bids Aug. 17.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Jones Bros. & Co.,** Wilson, N. C. CA $1,182,890. HOSPITAL, FAYETTEVILLE, N. C. Cumberland Co., Fayetteville, N. C. CD 8/28, under LB.

Groves Thread Co., Gastonia, N. C. Owner Builds. $125,000. MILL addn., GASTONIA, N. C.

Claussen's Bakery, Augusta St., Greenville, S. C. cancelled bids to have been opened Sept. 1. bakery addn., GREENVILLE, S. C. CD 8/25.

R. A. C. Realty Co., 40 Pryor St., Atlanta, Ga., Owner Builds, $85,000, WAREHOUSE—OFFICE, Chesire Bridge Rd., ATLANTA, GA.

Cordele Casualwear Corp., Cordele, Ga., Owner Builds $100,000 PLANT ADDN. No. 4, CORDELLE, GA.

▲ **B & B Constr. Co.,** Box 5163, Ardmore Sta., Windsor-Salem, N. C., LB, $1,447,000, Wherry Act HOUSING units, FORT McCLELLAN, ALA. U. S. Eng., South Atlantic Div., P.O. Bldg., Atlanta, Ga. Bids Aug. 26. CD 7/29.

Westinghouse Electric Co., Union Bank Bldg., Pittsburgh, Pa. LB $337,640. steam-electric PLANT addn., MONROE, LA. City, Monroe, La. Bids Aug. 25. CD 8/12.

Dye & Mullings Inc., P.O. Drawer 112, Columbia, Miss. CA Est. $750,000. department STORE, MONROE, LA. Sears, Roebuck & Co., 675 Ponce De Leon Ave. Atlanta, Ga. Bids July 31. CD 7/27.

E. B. Ludwig Constr. Co., 1350 Jefferson Hy., New Orleans, La. CA Est. $100,000 WAREHOUSE, NEW ORLEANS, LA. Howard Motors, Inc., 901 St. Charles Ave., New Orleans, La.

Perrilliat Rickey Constr. Co., 1530 S. Rendon St., New Orleans, La. LB $905,313. brick, steel, concrete MOTHER HOUSE and NOVITIATE, NEW ORLEANS, LA. Sisters of the Holy Family, 717 Orleans St., New Orleans, La. Bids Aug. 25. CD 8/26.

Southern Builders, Inc., P.O. Box 1815, Shreveport, La. LB $379,000. Sunset Acres Elementary SCHOOL, SHREVEPORT, LA. Caddo Parish School Bd., Court House, Shreveport, La. Bids Aug. 24. CD 8/14.

▲ **Huber Hunt & Nichols,** Speedway, Indianapolis, Ind. CA Est. $4,000,000. general contract;

Freyn Co., 1028 N. Illinois St., Indianapolis, Inc. CA Approx. $800,000 plumbing, sewer constr., sprinkler work for ASSEMBLY PLANT No. 2, LOUISVILLE, KY. Ford Motor Co., 3000 Schaefer St., Dearborn, Mich. Bids Aug. 11, awarded Aug. 18. CD 8/4.

▲ **Algernon Blair Co.,** First National Bank Bldg., Montgomery, Ala. LB $3,390,000. 305x700 ft., brick, concrete High SCHOOL, PADUCAH, KY. Paducah Independent School Dist., Paducah, Ky. Bids Aug. 10. CD 7/27.

Mark Trammell Constr. Co., Hy. 11-E, Bristol, Tenn. Owner Builds. $800,000. 70 RESIDENCES, BRISTOL, TENN.

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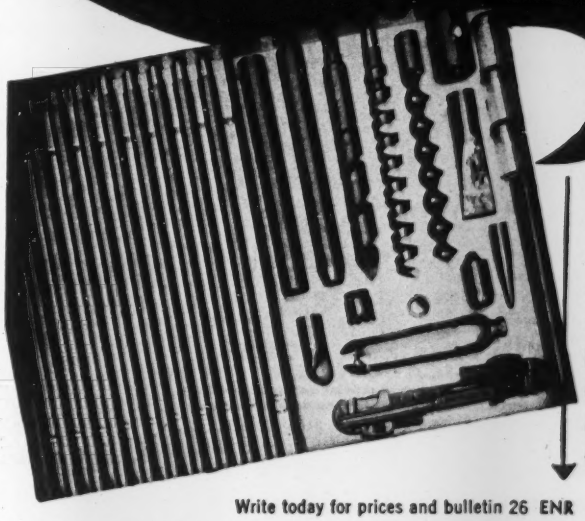

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R. E. Dunn Co., 207 12 Ave. S., Nashville, Tenn. CA $260,000. brick, stone, steel fertilizer PLANT, CLARKSVILLE, TENN. International Mineral & Chemicals Co., Clarksville, Tenn. Bids June 15, awarded Aug. 25. CD 6/12.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

WISCONSIN—B.A. 9/15—State Hy. Comn., State Hy. Office Bldg., Madison

Dodge Co.—Contract 1, structure B-14-14 0.035 mi. C.T.H. "T" - C.T.H. "G" (Krueger Bridge) Road C.T. Hy "I" Proj. S 0891 (1).

Marathon Co.—Contract 1, structure and approaches 0.189 mi.; The S.T.H. 13-Stratford Rd., S.T. Hy. 153, Proj. S 011 (7).

Vernon Co.—Contract 1, structure B-62-9 The Genoa-Stoddard Rd., S.T. Hy. 35, Proj. F 057-1 (5). E. L. Roettiger, state hy. engr.

WISCONSIN—B.A. 9/15—State Hy. Comn., State Office Bldg., Madison,

Dodge Co.—Contract 1, c. conc. 0.277 mi. The Wisconsin State Prison (entrance and Inner Drives), Proj. N 0-6 (27)

Juneau and Sauk Counties—Contract 1, grading, base course and structures 3.271 mi. The Wonewoc-LaValle Rd., S.T. Hy. 33, Proj. T 0332 (5) and T 0332 (4) Proj. T 0332 (5) and T 0332 (4).

Pierce Co.—Contract 2, gravel or crushed stone base course 1.867 mi. The Ellsworth-Durand (Lowry Hill Relocation) Road, Prom F-019-1 (33)

Portage Co.—Contract 3, disintegrated granite base course 6.484 mi. The Junction City-North County Line Road, C.T. Hy. "O" Proj. S 0532 (4) and S 1139 (1).

Rock Co.—Contract 1, misc. constr. 0.457 mi. Madison Avenue (Village of Milton) Proj. T 026 (4).

Washington Co.—Contract 4, grav. or crushed stone base course 7.575 mi. The S.T.H. 60 - Dodge County Line (U.S. H. 41 Relocation) Road, U.S. Hy. 41, Proj. F 03-1 (4)

Contract 5, grav. or crushed stone base course, 8.704 mi. The S.T.H. 60 - Dodge County Line (U.S. H. 41 Relocation) Road, U.S. Hy. 41, Proj. F 03-1 (4). E. T. Roettiger, state hy. engr.

† **O., Youngstown**—TAXIWAY and APRON—B.A. On Or About 9/16—U.S. Eng., 237 Fourth Ave., Huntington 18, W. Va., resealing joints in taxiway and apron paving at Youngstown Municipal Airport, at Vienna, Trumbull Co. ENG.-46-022-54-6.

MICHIGAN—B.A. 9/16—State Hy. Comn., 222 Townsend St., Lansing, Zone 13,

Newaygo Co.—rein.-con. T-beam bridge over 5 Mile Creek 0.138 mi. approaches grading with aggregate surf. course on M-20, 2½ mi. north of White Cloud, $30,000. Plans deposit $3, no refund.

† **Michigan**—B.A. 9/22—U.S. Eng., 428 Federal Bldg., Milwaukee 1, Wis., rubble mound shore connection at Manistique Harbor, CIVENG-47-013-54-5. CD 8/27.

† **O., Dayton**—HOSPITAL—B.A. 9/22—U.S. Eng., 830 W. Broadway, Louisville 3, Ky., air force hospital Wright-Patterson Air Force Base, ENG-14-029-54-12, Plans deposit $100. Extended date. CD 7/31.

OHIO—B.A. 9/29—Ohio Turnpike Comn., 139 E. Gay St., Columbus,

Erie Co.—Sect. 31, 3 single bridges, three twin bridges, 3 box culverts for drainage, grading, drainage structures paving approx. 3.7 mi. beginning at point about 3,900 ft. east of Thomas Rd. exten. eastwardly to point about 916 ft. east of State Rte. 299 the interchange with State Rte. 250.

Sect. 32, 2 single bridges, two twin bridges, two box culverts for drainage, grading, drainage structures, paving approx. 4.1 mi. beginning at point about 4,321 ft. west of Patten Tract Rd. etxen. eastwardly to point about 3,900 ft. east of Thomas Rd.

Sect. 33, two single bridges, three twin bridges and 4 box culverts for drainage, grading, drainage structures, paving approx. 3.1 mi. beginning at point about 465 ft. west of Billings Rd. exten. eastwardly to point about 4,321 ft. west of Patten Tract Rd. CD 8/11/51, under Streets and Roads.

BIDS ASKED—BUILDINGS

Mich., Dearborn—INDUSTRIAL RELATIONS—Bids Asked—Ford Motor Co., 3000 Schaefer St., 2 story, brick, concrete industrial relations bldg., Engineering Center, Oakwood and Village Rd. $300,000. Voorhees, Walker, Foley & Smith, 101 Park Ave., New York, N. Y., archts. CD 6/7/46.

HEAVY CONSTRUCTION
LOW BIDS AND CONTRACTS

▲ **OHIO**—Ohio Turnpike Comn., 139 E. Gay St., Columbus, Zone 15,

Western Contg. Corp., 400 Benson Blvd., Sioux City, Ia. LB $10,030,453. structures 4.6 mi. Sect. C-13, Summit and Portage Counties and structures 4.64 mi. Sect. C-14, Summit Co. Bids Aug. 26. CD 7/30.

▲ **OHIO**—State Hy. Dpt., Columbus,

Hatcher Bros. Co., Mingo Jct., O. LB $1,903,848. est. $2,211,500. approaches to Steubenville Ohio Bridge, Jefferson Co.;

C. F. Reprogle Co., Circleville, O. LB $1,564,072, est. $1,451,800. 221 ft. bridge over Ohio River, at Marietta;

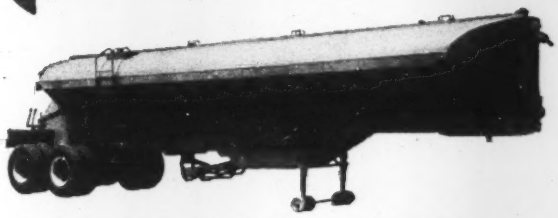
Harper Supply Co., Napoleon, O. LB $150,732, est. $147,450. repaving, reconstr. 3.255 ft. railroad

(Continued on page 117)

PLANNING A Project?

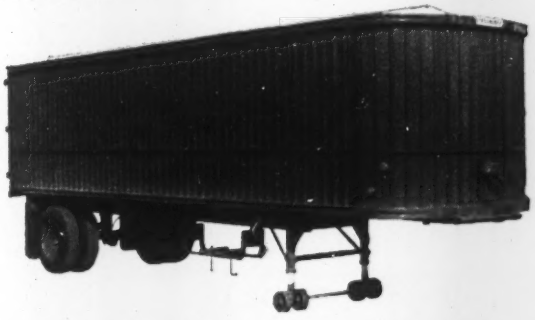
TRAILMOBILE CAN HELP YOU!

If you're planning a project or already have one under way that calls for the use of versatile trailers, Trailmobile has the right equipment to help you out.

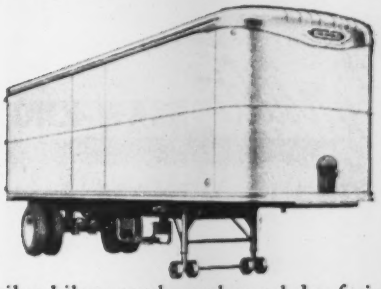


A Trailmobile Bulk Cementer can haul up to 150 barrels of dry cement per trip. Unloads completely in 45 minutes with patented step-down positive screw discharge. Available in either single or tandem axle models.

Trailmobile tank trailer provides a mobile gasoline, kerosene, oil or water station for all on-site equipment. Also available in acid, asphalt and special models built to meet your specifications.

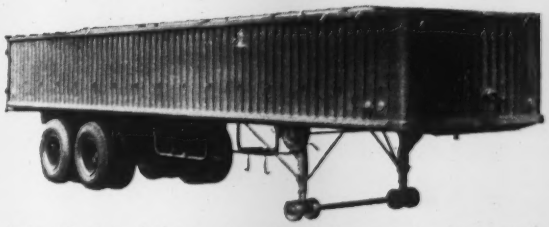


Here's a corrugated steel open top Trailmobile that answers problems of hauling bulky, concentrated loads which can be crane-loaded. This rugged model has an extremely high strength-to-weight ratio and it will quickly pay its way in durable performance.



The Trailmobile smooth steel panel dry freight van is the toughest and strongest in the Trailmobile line. It can take the punishment and abuse that rugged conditions can give it—for years. It's ideal for hauling equipment to and from the construction site.

To give you an idea of the strength in this Trailmobile platform trailer, its main rails are 15" deep. Trailmobile also makes this model in a Four Wheeler Flat. Either can carry maximum loads of lumber, pipes, steel, sheet metal, or what have you.



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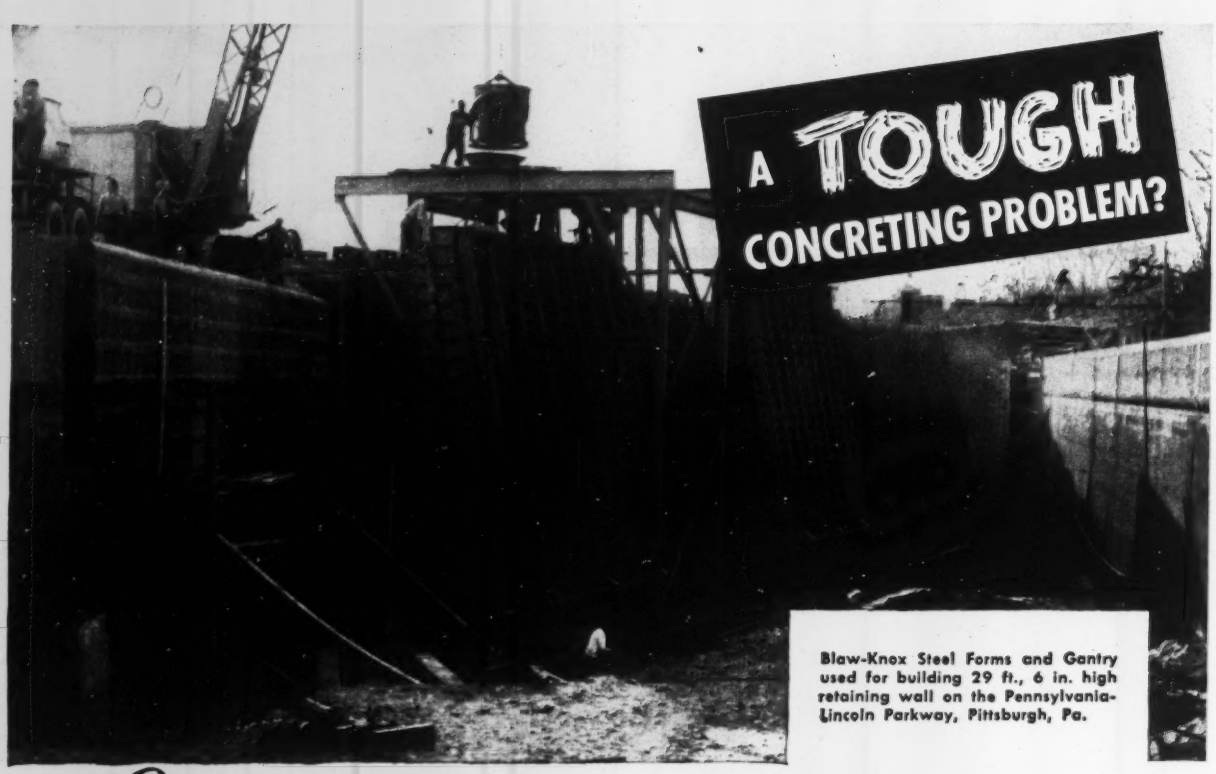

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BLAW-KNOX

(Continued from page 114)

crossing and bldg. bridge on State Rte. 15, Williams Co.* Bids Aug. 25. CD 8/5. under Streets and Roads.

▲ OHIO—State Hy. Dpt., Columbus,

B & G Bituminous Co., Sidney, O. LB $575,845, est. $548,000. paving, wid'n. 11 mi. U. S. 25 and constr., wid'n. 3 bridges, Shelby Co.;

McCourt Constr. Co., 720 Home St., Akron, O. LB $112,959, est. $104,000. wid'n., resurf. 2.3 mi. State Rtes. 5 and 14 in Ravenna;

Fenton Constr. Co., Masters Ave., Ashland, O. LB $104,789, est. $96,300. wid'n., paving 2.3 mi. U. S. 33 in Bellefontaine and Logan Co.;

Ohio Road Improvement Co., 30 E. Broad St., Columbus, O. LB $132,082, est. $134,600. wid'n., resurf. 3.4 mi. State Rte. 34 in Canton, Stark Co.; LB $108,636, est. $109,100. wid'n., resurf. 3.1 mi. State Rte. 5 and 45 and U. S. 424 in Warren; LB $178,235, est. $169,500. wid'n., resurf. 3 mi. County Road 69, Trumbull Co. Bids Aug. 25. CD 8/5.

▲ Maxon Constr. Co., 131 N. Ludlow St., Dayton, O., CA $1,044,628, Patterson-Riverside Bridge, four-lane, DAYTON, O. City, Dpt. Service & Buildings, 500 Municipal Bldg., Dayton 2, O. Bids Aug. 20, awarded Aug. 26. CD 8/26, under LB.

R-W Constr. Co., 3218 W. Fond du Lac Ave., Milwaukee, 10, Wis., CA, $99,585, sewers in W. Thurston Ave. and in Fairmount Ave., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids Aug. 19, awarded Aug. 24.

White Consolidated, Inc., 710 N. Plankington Ave., Milwaukee, 3, Wis., CA, $137,183, asph. paving W. Hopkins St., MILWAUKEE, WIS. City, City Hall, Milwaukee, Wis. Bids Aug. 21, awarded Aug. 24.

Druml Co., 161 W. Wisconsin Ave., Milwaukee, 3, Wis., CA, $113,882, grading, paving at county airport, MILWAUKEE, WIS. Milwaukee County Institutions, Milwaukee, Wis. Bids Aug. 13.

Becker Constr. Co., Elm Grove, Wis., LB $845,460 STADIUM addn., MILWAUKEE, WIS. Milwaukee County Park Comn., Court House, Milwaukee, Wis. Bids Aug. 21. CD 7/31.

W. J. Lazynski, Inc., 906 E. Center St., Milwaukee, 12, Wis., CA, $148,282, sanitary sewers various streets, RIVER HILLS, WIS. Village, 7650 N. Pheasant Lane, Milwaukee, 11, Wis. Bids Aug. 6.

▲ MICHIGAN—State Hy. Dpt., 222 Townsend St., Lansing, Zone 13,

L. A. Davidson Co., 213 E. St. Joseph St., Lansing, Mich. LB $1,398,133, est. $1,328,000. 2 railroad bridges and retaining walls to carry N.Y.C. and Grand Trunk & Western R.R. over Edsel Ford Expressway, UI X9 of 82-22-10 C1-U (UI 391 64), Wayne Co.; LB $381,281, est. $380,000. rein.-con. steel bridge on Second over Edsel Ford Expressway relocation utilities, BUI B39 of 82-22-10 C1-U (BUI 391-51), Wayne Co.; LB $453,303, est. $470,000. grade separation structure wing walls 2 rein.-con. retaining walls, drainage sidewalks, Pallister St., BUI B34 of 82-22-12 C1-U, (BUI 404 58), Wayne Co.; LB $307,048, est. $320,000. grade separation Seward Ave. over John C. Lodge Expressway, rein.-con., steel BUI B35 of 82-22-12 C1-U (BUI 404) Wayne Co.; LB $366,827, est. $380,000. rein.-con. steel grade separation Euclid Ave. over John C. Lodge Expressway retaining walls, light and power utilities, BUI B36 of 82-22-12 C1-U (BUI 404-60), Wayne Co.;

Proksch Constr. Co., Iron River, Mich. LB $78,898., est. $80,000. rein.-con. steel bridge over Indian River on relocation of M-94, SS B1 of 76-4-5 C1-R (S 450 4), Schoolcraft Co. Bids Aug. 26. CD 8/6 and 8/19.

Porath & Son Co., 702 Transportation Bldg., Detroit, Mich. CA $156,380. Group 53-7, c. con. 9,715 ft. parts of Longacre, Riverdale, Lisbold, Huntington, Faust, Steopel, Minock and Redfern Sts., DETROIT, MICH. City, Carl D. Warner, comr., Guardian Bldg., Detroit, Mich. Bids May 12. CD 3/30/43.

BUILDINGS

LOW BIDS AND CONTRACTS

▲† George Sheaf & Co., 449 Neilston St., Columbus, O. CA $2,190,672, DECONTAMINATION and RECOVERY Bldgs., for Gaseous Diffusion PLANT (Subcontractor under Peter Kiewit Sons' Co., P.O. Box 268, Portsmouth, O.) for Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash., D.C., PIKETON and WAKEFIELD, O. CD 8/13/52, under CA.

I. Bush & Sons, S. Brook St., Louisville, Ky., LB, $386,000, Corydon High SCHOOL addn., CORYDON, IND. Corydon School Bd., Corydon, Ind. Edward D. James, 257 Bakemeyer St., Indianapolis, Ind., archt.

E. W. Hanck Constr. Co., Lemcke Bldg., Indianapolis, Ind., LB, $385,000, brick, stone, rein.-con. Junior and Senior HIGH SCHOOL, GREENWOOD, IND. Greenwood School Bldg. Corp., Greenwood, Ind. Bids Aug. 10. CD 7/31.

Ernest M. Novak, 5842 Addison St., Chicago, Ill., Owner Builds, $860,000 70 HOMES in HARWOOD HEIGHTS, ILL. Robert L. Shoyer & Assocs., 4709 Deming Pl., Chicago, Ill., archts.

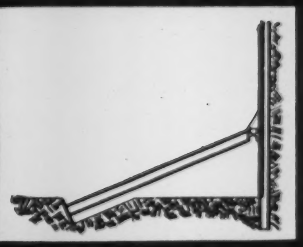
Joliet Best Homes, Inc., 1100 Kings Lane, Joliet, Ill., Owner Builds, $800,000, 80 HOMES, JOLIET, ILL.

Garfield Enstrom & Sons, 550 S. Summit St., Village Park, Ill., Owner Builds, $900,000, 60 HOMES, near VILLA PARK, ILL.

W. D. Smith Constr. Co., 3435 S. 60 St., Milwaukee, 14, Wis., CA, $414,000, 48 frame, no bsmnt., RESIDENCES, MILWAUKEE, WIS. South View Heights Corp., 1514 N. 12 St., Milwaukee, 5, Wis.

Selmer Co., 128 N. Pearl St., Green Bay, Wis., LB, $483,549 general contract SENIOR HIGH SCHOOL, Town of PREBLE (P.O. GREEN BAY) WIS. Preble-Humboldt School District, 2052 Deckner Ave., Green Bay, Wis. Bids July 31.

DIFFICULT FOUNDATION WORK



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C-14

Gebhard-Berghammer, Inc., 5420 W. State St., Milwaukee, 8, Wis., CA, 1 story, 47x234 and 138x143 ft., concrete block, steel FACTORY addn., SOUTH MILWAUKEE, WIS. Milwaukee Equipment Mfg. Co., 311 Marion Ave., South Milwaukee, Wis. CD 8/10.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

† **Okla., Altus**—HOSPITAL—B.A. 9/17—U. S. Eng., Box 61, Tulsa, hospital, Altus Air Force Base, ENG-34-066-54-13. $700,000. CD 9/24/51.

† **SOUTH DAKOTA**—B.A. 9/17—Bureau P. Rds., Dpt. Commerce, Bldg. 40, Denver Federal Center, Denver, Colo.

Jackson and Pennington Counties—grading, surf. 3.43 mi. Badlands Proj. 1-B (por.) Cedar Pass and Pinacles Hy. Over $60,000. Glen W. Williams, div. engr.

Minn., North St. Paul—B.A. 9/23——Village, G. E. Olson, mgr., 13,777 lin. ft. 8- to 24-in. sanitary sewer appurtenances, $100,000. Plans deposit $20, Banister Eng. Co., 1549 University Ave., St. Paul, engr. CD 6/23.

† **Minn., Minneapolis**—CONVEYING SYSTEMS—B.A. 9/25—U. S. Eng., 1709 Jackson St., Omaha, Neb., conveying systems, Bldg. 189 TCA, Inv. 25-066-54-18.

Minn., Glencoe—B.A. 10/8—City, Mrs. Selma Zavoral, clk., sewage treatment plant, $300,000. Plans deposit $20. Banister Eng. Co., 1549 University Ave., St. Paul, engrs. CD 3/18.

Mo., St. Joseph—FIELD HOUSE—Bids Asked—Park Bd., City Hall, Noyes Field House, etc. $158,000. Everett Johns, Empire Trust Bldg., archt. CD 4/23.

BIDS ASKED—BUILDINGS

Minn., Barnesville—SCHOOL—B.A. 9/16—Bd. Educ., G. H. Felde, clk., school, altering existing bldg. $650,000. Plans deposit $10. Armstrong & Schlichtin, 5 E. 22 St., Minneapolis, archts. CD 1/27.

Tex., Bowie—ARMORY—B.A. 9/22—Texas National Guard, Camp Mabry, Austin, and State Bd. Control, Austin, 1 story, 12,000 sq. ft. brick, concrete armory, $135,000, Roy D. Sanders, Jr., Bowie, superv. archt.

▲ **Tex., Ft. Worth**—STUDENT UNION—B.A. 9/22—Texas Christian University, T.C.U. Campus, Ft. Worth, 110x240 ft., brick, stone exterior student union bldg., rein.-con. fdn. $1,000,000. Bid date changed. Preston M. Geren, 1607 Ft. Worth Natl. Bank Bldg., archt. CD 8/25.

Tex., Longview — AUDITORIUM, etc. — B.A. 9/24 — Longview Independent School Dist., Longview, auditorium-cafeteria and administration offices bldg. $325,000. Plans deposit $25. Wyatt C. Hedrick, 904 Ft. Worth Ave., Dallas, Tex., archt. and engr. CD 10/23.

Minn., Chatfield—SCHOOL—B.A. 9/30—Bd. Educ., L. J. Kivell, clk., school addn. $400,000. H. H. Swanson, 500 Sexton Bldg., Minneapolis, archt. CD 6/3.

Minn., Winnebago—SCHOOL—B.A. 10/10—Bd. Educ., C. W. Robertson, clk., school bldgs. $700,000. H. H. Swanson 500 Sexton Bldg., Minneapolis, archt. CD 4/22.

Mo., Springfield—STORE—Bids Asked—F. W. Woolworth Co., 3663 Lindell St., St. Louis, 3 story, bsmnt., L-shaped store, 2 escalators, air-conditioned. $500,000. CD 8/28.

SOON LETS CONTRACT—BUILDINGS

Mo., Boonville—Telephone—Southern Bell Telephone Co., c/o Robt. Burns, 1010 Pine St., St. Louis, soon lets contract 2 story, brick, rein.-con., telegraph bldg. addn. Neville, Sharp & Simon, 15 E. 12 St., Kansas City, Mo., archts.

Tex., Houston—AUTO SALES, etc.—Finnigan Estates, First National Bank Bldg., soon lets contract auto sales, service shop. $300,000. CD 8/19.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

Concrete Constr. Inc., Litchfield, Minn. CA $62,842. Bridge No. 6639 over Crockers Creek in Faribault, Rice Co. Bids Aug. 14. CD 7/30.

MINNESOTA—State Hy. Dpt., 1246 University Ave., St. Paul,

W. Hodgman & Sons, Fairmont, Minn. CA $90,253. grav. base, road-mixed bit. base plant-mixed bit. surf. 3.2 mi. between Granada and TH 16. Martin Co.;

W. Zaske, Daunbe, Minn. CA $358,939. grav. base, plant-mixed bit. surf. 1.32. mi. between Waconia and Chanhassen, Carver Co.;

Fielding & Shepley, 1258 Bohn Ave., St. Paul, Minn. CA $114,924. crushed rock base, b. conc. on Maryland Ave. (St. Paul) between Abell St. and Mississippi, Ramsey Co. Grand total $564,116. Bids Aug. 14. CD 7/30.

R. M. Starry, Long Prairie, Minn. CA $91,363. grading, sand-grav. sub-base, grav. base road-mixed bit. surf. 4.5 mi. between CAR 68 in Melrose and SAR 17, 4 mi. N of Melrose and 6 mi. between 0.5 mi. E. of Sauk Centra and SAR 13, 4 mi. N. of Melrose. ST. CLOUD, MINN. Stearns Co., F. Ramler, aud., St. Cloud, Minn. Bids Aug. 19. CD 7/30.

IOWA—State Hy. Comn., Ames,

Christensen Bros., 3011 Virginia St., Sioux City, Ia., LB, $146,678, Group 1, bridges and culverts F-459 (2) Harrison and Pottawattamie Counties;

Ben Cole & Son, Ames, Ia., LB, $99,011 Groups, 2, 3, 4, S-1883 (1), Mahaska and Marion Counties. Bids Aug. 25. CD 8/13.

IOWA—State Hy. Comn., Ames

Orville Eblen Constr. Co., Atlantic, Ia., LB, $241,132 grading 13.305 mi. F-459 (2), Harrison and Pottawattamie Counties. Bids Aug. 25. CD 8/13.

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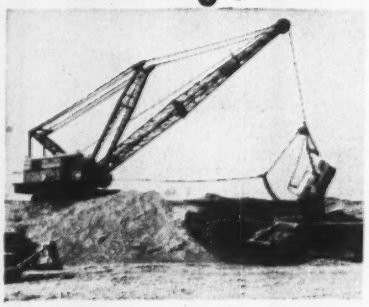

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C-15

† **Patton-Tully Transportation Co.**, 1242 N. 2 St., Memphis, Tenn. LB $346,126, est. $416,975. pile dike revetment Burlington to Straubs Bend, 50 mi. Missouri River, near Jefferson City, CIVENG 54-3, MISSOURI. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Aug. 26. CD 7/30.

† **Massman Constr. Co.**, 20 W. 9 St., Kansas City, Mo. LB $407,420, est. $440,040. pile dike, revetment Crooked River to Tamberlane bends, near Waverly, MISSOURI. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Aug. 25. CD 6/1/44.

† **Seth E. Giem & Assoc.**, Land Bank Bldg., Springfield, Mo. LB $313,313, est. $295,115. motor pool and storage bldgs., Eng. 54-6.

Sam E. Davis Co., Land Bank Bldg., Springfield, Mo. LB $147,000. parachute bldg., photographic laboratory, etc., Eng. 54-7, Grandview Air Force Base, GRANDVIEW, MO. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Aug. 26. CD 8/4.

Associated Contractors, Inc., Monroe, La., LB, $142,720 channel excav., TYRONZA, ARK. Drainage District No. 6, Tyronza, Ark. Bids Aug. 14. CD 8/6.

† **George Cook Constr. Co.**, 1740 Vine St., Lincoln, Neb. LB $285,090. armament and electronics shop Lincoln Air Force Base, Inv. 25-066-54-12, LINCOLN, NEB. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Aug. 25. CD 8/19.

† **Massman Constr. Co.**, 20 W. 9 St., Kansas City, Mo. LB $286,017, est. $312,311. pile dike revetment Kickapoo to Pomeroy Bends, near Leavenworth, Leavenworth and Platte Counties, CIVENG—54-2, KANSAS. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Aug. 25. CD 8/19, under LB.

Broce & Smith Constr. Co., Larned, Kan. LB $123,358. 56,600 sq. yd. hot bit. material paving, GREAT BEND, KAN. City, c/o A.W. Herzog, clk., Great Bend, Kan.

† **Star Industries, Inc.**, 610 N. Main St., Wichita, Kan. LB $60,622, est. $65,361. 10,000 bbl. fuel storage tank, Wichita Air Force Base, WICHITA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City, Kan. Bids Aug. 26. CD 8/4.

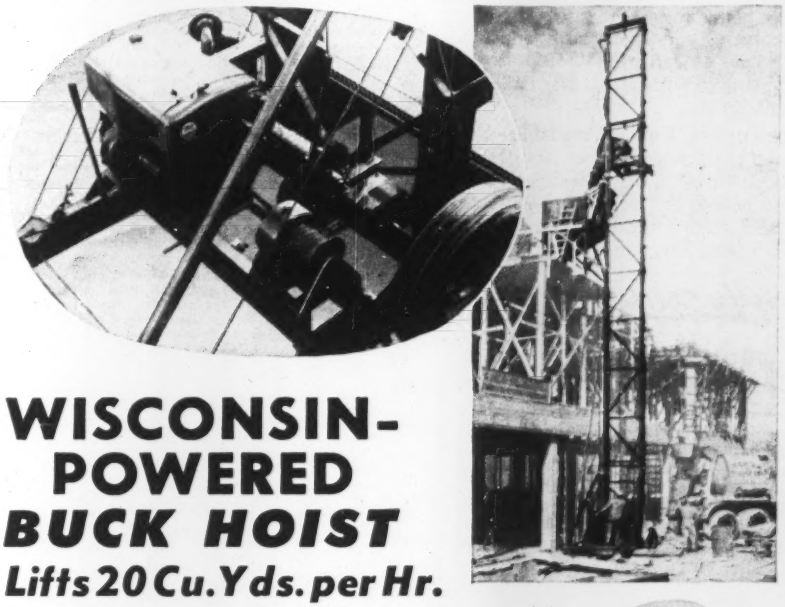
TEXAS—State Hy. Comn., Austin,

Gulf Bitulithic Co. and F. M. Reeves & Sons of Austin, P.O. Box 2572, Houston, Tex. CA $757,467., stabilized base, c. conc. 0.566 mi. U. S. Hy. 75, Proj. UI 32 (15), Harris Co. Bids Aug. 18, awarded Aug. 24. CD 8/25, under LB.

TEXAS—State Hy. Comn., Austin,

Austin Road Co., P.O. Box 1590, Dallas, 1, Tex. CA $517,581. c. conc. 2.535 mi. Hy. SH 342, Proj. C48-1-12, Dallas Co. Bids Aug. 19, awarded Aug. 24. CD 8/27, under LB.

▲ **Lone Star Gas Co.**, 1915 Wood St., Dallas, Tex. Owner Builds. $875,000, 44 mi. 12 in. gas transmission line from north of Tyler to near Sulphur



WISCONSIN-POWERED *BUCK HOIST*

Lifts 20 Cu. Yds. per Hr.

Here's another typical Wisconsin Heavy-Duty Air-Cooled Engine construction application . . . hoisting concrete for the new Chemistry Building at Xavier University, Cincinnati, O. A Model TE 2-cylinder Wisconsin Air-Cooled Power Unit handles the load, delivering up to 20 cu. yds. of concrete per hr. with a ½ yd. self-dumping bucket (dumping here at the 56 ft. level). In addition, the tower is self-erecting up to 40 ft. according to the manufacturer, Buck Equipment Corporation, Cincinnati 2, Ohio.

Power TO FIT THE JOB

Power TO FIT THE MACHINE

4-Cycle Single, 2-and4-Cylinder Models 3 to 36 H.P.

The construction contractor reports that the rig works equally well bringing up bricks, cut stone, reinforcing rods, steel beams and other materials. All of which calls for HEAVY-DUTY DEPENDABILITY from the Power Unit.

Wisconsin Engine features such as tapered roller bearings at both ends of the crankshaft, gear-driven high tension outside magneto, positive AIR-COOLING and lubrication contribute to all-around dependability and peak performance, day-in and day-out, at all seasons.

You can't go wrong when you specify Wisconsin Air-Cooled Engine Power for your equipment.

MOST H.P. HOURS

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN

CONTRACT BONDS

–BID–

–PERFORMANCE–

–PAYMENT–

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New Woven Tape Is Non-Metallic

THE *LUFKIN* HI-LINE NON-METALLIC WOVEN TAPE

The toughest miracle fibres recently developed by science are used in this new tape, which is designed in every way for longer wear. It has greatest dimensional stability—even after it is repeatedly soaked and dried. Markings are protected by coatings of specially compounded plastic that is resistant to abrasion, cracking, mildew, moisture, and temperature changes. The case is hand-stitched genuine leather, as tests have proven that leather wears longest. The first end of the tape—the point of greatest wear—is reinforced with durable green plastic, imprinted "Non-Metallic." "Instantaneous" readings are faster, more accurate. Last preceding foot number is repeated in red at each inch (or tenth of a foot). Total reading is at point of measurement.

Numerous Applications—the non-metallic Hi-Line is ideal for power, utility, and general work around high tension circuits. Woven tapes are popular in highway and general construction work when steel tape accuracy is not required. The Hi-Line can take the abrasion, moisture, and general hard usage which these jobs require. This tape is indicated wherever a non-conductor is needed. One example is in pipe-line work when companies check pipe laid for payment. Often such measuring goes across farm lands where electric fences give "jolts" to men measuring with steel or metallic woven tapes.

Descriptive Folder Available—a four-color folder describing the Hi-Line, and listing lengths, markings available, and prices, can be obtained by writing The Lufkin Rule Company, Saginaw, Michigan, Dept. ENR.

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FROM YOUR SUPPLY HOUSE

THE LUFKIN RULE CO., SAGINAW, MICH. 219

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FLINT STEEL CORPORATION

TULSA **MEMPHIS**

Springs; $90,000, field gas gathering lines in Red Springs area, near Tyler; $100,000, electric type sub-station, Tyler Area, foregoing in Smith Co. TEXAS. Grand total $1,065,000. CD 8/13.

Bernard Electric Co-operative, Bellville, Tex., Purchase and Hire, $125,000, rural distr. lines, Austin Co., TEXAS. CD 1/11/51.

City, Angleton, Tex. Purchase and Hire. $35,000. some water distr. lines, ANGLETON, TEX. Garrett Eng. Co., 5008 Almeda St., Houston, Tex., engr.

A. P. Kasch & Son, Big Spring, Tex., CA $398,625 Alternate Bid, filter plant imprvs., BIG SPRING, TEX. City, City Hall, Big Spring, Tex. CD 8/26, under LB.

† **U. S. Govt.,** c/o The Post Engineer, San Jacinto Ordnance Depot, Channelview, Tex., rejected bids June 29 water sys. overhauling imprvs., for San Jacinto Depot, CHANNELVIEW, TEX. CD 6/10.

P. C. Sorenson & Co., Inc., 2205 S. Industrial St., Dallas, Tex. LB $63,113. Woodcrest Lane storm sewers, DALLAS, TEX. City, City Hall, Main and Harwood Sts., Dallas, Tex. Bids July 27. CD 6/4.

† **Butte Pump & Machinery Co., Inc., Rte. 2,** Box 209, Las Cruces, N. M. LB $48,711, est. $35,000. 4-unit pumping station over 4,400 gpm, Fort Bliss, ENG-29-005-34-7, EL PASO, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Aug. 20. CD 7/6/51, under Public Buildings.

† **Empire Electric Co.,** Box 560, Fort Worth, Tex. LB $90,282. airfield lighting, Biggs Air Force Base, ENG-29-005-54-6, EL PASO, TEX. U. S. Eng., Box 1538, Albuquerque, N. M. Bids Aug. 14. CD 7/16.

† **Everett, Smith & Everett,** 3305 Lombardy Lane, Dallas, Tex. LB $307,198. academic bldg., synthetic trainer bldg., training squadron headquarters bldg., operations, Harlingen Air Force Base, ENG-41-243-54-4, HARLINGEN, TEX. U. S. Eng., Box 1229, Galveston, Tex. Bids Aug. 21. CD 6/29, under LB.

Marchant & Balay, Box 545, Mercedes, Tex. LB $67,-392, est. $40,000. Contr. 2, asbestos cement water lines, appurtenances, VELASCO, TEX. City, Velasco, Tex. Bids Aug. 21. CD 8/13.

Marchant & Balay, Box 545, Mercedes, Tex. LB $86,-657, est. $65,000. Contr. 3, clay, tile sewer lines, appurtenances, VELASCO, TEX. City, Velasco, Tex. Bids Aug. 21. CD 8/13.

† **Thayn Constr. Co.,** 2670 Berkeley Circle, Salt Lake City, Utah. CA $787,894. Bull Hook unit of Havre flood control proj. diverting Bull Hook Creek from present channel through Havre, Hill Co., MONTANA. U. S. Eng., Fort Peck, Mont. Bids Aug. 12, awarded Aug. 19. CD 8/18, under LB.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver, rejected bids Aug. 20, 2 bridges 0.037 mi. State Hy. 135, S 0119 (10), Gunnison Co. LB, $116,316. CD 8/28, under LB.

COLORADO—State Hy. Dpt., 518 State Office Bldg., Denver,

Northwestern Engineering Co., 6000 Colorado Blvd., Denver, Colo., CA, $197,215, est. $234,566 combined Colo. Proj. 23.954 mi. total, Colo. Proj. C-14006-13, in Canon City, Colo. Proj. C-14006-14 5 miles; C40-006-19 1.036 mi. Colo. Proj. S-0119 (4) 7.93 mi. Fremont and Gunnison Counties;

G. E. Blanchard Contractor, Derby, Colo., CA $268,593, est. $203,639, stab., asph. surf. 7.793 mi. State Hy. 19, C-20-0019-08, La Plata Co.;

L. J. Hesser, Greeley, Colo., CA, $91,900, est. $82,889, asph. surf. 0.11 mi. C 03-003-14; stab. asph. surf. 0.252 mi. C-03-0016-08, 1.071 mi. Weld and Larimer Counties. Bid Aug. 25, awarded Aug. 26.

BUILDINGS

LOW BIDS AND CONTRACTS

McGough Bros., 1954 University Ave., St. Paul, Minn. CA Est. $600,000. 110x150 ft. CHURCH, incl. 2 story wing, MINNEAPOLIS, MINN. St. Olaf's Church, Rev. L. Cowley, Eighth St. and Second Ave. S., Minneapolis, Minn. Bids Aug. 14. CD 7/29.

Hasslen Constr. Co., Ortonville, Minn. CA $377,700. SCHOOL addn., alterations to present bldg., ORTONVILLE, MINN. Bd. Educ., Mrs. John Sparrow, clk., Ortonville, Minn. Bids Aug. 20. CD 7/29.

▲ **Long Constr. Co.,** Rialto Bldg., Kansas City, Mo. CA Est. $8,000,000. general contract, 8 story, 756,000 sq. ft. PLANT addn., on 7½ acres, 25 and McGee-Locust Sts., KANSAS CITY, MO. Hall Bros., Inc., c/o Joyce C. Hall, pres., 25 and Grand Sts., Kansas City, Mo. Awarded Aug. 25. CD 7/15, under LB.

▲ **Fraser Constr. Co., Inc.,** 322 S. 9 St., Ft. Smith, Ark., CA, $1,000,000. PLANT, FORT SMITH, ARK. Harding Glass Co., 2524 N. 11 St., Ft. Smith, Ark. Bids Dec. 30. CD 12/8.

Turner-McKay, North Little Rock, Ark., CA, $115,310 POWER PLANT structures, piping and wiring, HOPE, ARK. City, Hope, Ark. Bids June 23. CD 6/5.

J. E. Pyle Constr. Co., 207 W. 2 St., Little Rock, Ark., CA, $396,489, boys and girls DORMITORIES, PINE BLUFF, ARK. State Agriculture, Mechanical and Normal College, Pine Bluff, Ark. Bids Aug. 14. CD 7/22, under LB.

Wallin-Dickey-Rich Lumber Co., West Memphis, Ark., CA, $150,000 AUTO SALES and SERVICE, WEST MEMPHIS, ARK. Ben Klinke Motor Co., 304 E. Broadway, Memphis, Tenn. Bids Aug. 14. CD 8/13.

T. F. Powers Constr. Co., 217 Fourth Ave. N., Fargo, N. D. CA, two 100x200 ft. steel, galvanized metal WAREHOUSES, FARGO, N. D. Deere & Webber Co., C. R. Carlson Jr., vice pres., 800 Washington Ave. N., Minneapolis, Minn.

(Continued on page 122)

A Message to Men in charge of Ice Control:

Why You Should Order STERLING AUGER-ACTION ROCK SALT NOW!...

While You Have the Trucks and the Time... To Put It Where You Want It—When You Need It!

Why risk a public clamor next winter when it's actually more economical to be prepared? By ordering your STERLING ROCK SALT *now* you can cut handling costs—using your trucks, in slack periods during the next month or so, to distribute supplies to strategic storage points.

Then, when the first snow hits and every truck and every minute counts, you will *not* have to use your equipment to unload shipments—and for long hauls from primary storage to remote areas.

Your trucks and your men are free to start immediately *spreading* salt, not hauling it—*removing* snow, not driving through it.

No Losses in Storage. STERLING ROCK SALT, with only elementary covering, may be safely stored without loss at as many pickup points as you choose—instantly available to put your plan of attack into operation the minute the storm strikes.

Follow the Lead of the Biggest City and the East's "Snowiest" State. New York City and the State of New Hampshire, each with rugged snow clearance and traffic problems, use decentralized storage and *beforehand* ordering. Experience has proved the efficiency and economy of a definite pattern of operation, established *beforehand*—maintained throughout the winter.

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Contains 11 ways to store rock salt safely, economically — indoors or outdoors.

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TODAY!

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Buffalo, N. Y. • New York, N. Y. • Cincinnati, O. • Cleveland, O.
Philadelphia, Pa. • Pittsburgh, Pa. • Richmond, Va.

(Continued from page 120)

▲ **H. S. Holtze Constr. Co.**, 2121 E. 4 St., Sioux City, Ia., LB **$2,135,000**, general constr. Senior HIGH SCHOOL, GRAND ISLAND, NEB. Bd. Educ., Grand Island, Neb. F. W. McNett & Co., Grand Island, Neb. Bids Aug. 26.

▲ **Wescott-Bowen Constr. Co.**, 1734 R St., Lincoln, Neb. LB **$1,245,140**, general constr. Southeast Junior-Senior HIGH SCHOOL, LINCOLN, NEB. Bd. Educ., 720 S. 22 St., Lincoln, Neb. Bids Aug. 20. CD 6/23.

Floyd Richards, 511 W. 5 St., Amarillo, Tex. LB **$486,710**, est. $400,000. stone, brick, steel Y.W.C.A. BLDG., AMARILLO, TEX. Young Women's Christian Assn., Amarillo, Tex. Bids Aug. 19. CD 7/29.

▲ **M W. Kellogg Co.**, 225 Broadway, New York, N. Y. CA **$20,000,000**. design and construct REFINERY units, ortho-flow fluid catalytic crack unit, catalytic reformer, delayed cocker, catalytic polymerization unit, alkylation, furnaces, stills, cool towers, boilers, new laboratory, warehouse, 1,300,000 bbl. of steel tankage storage, AMARILLO, TEX. The Texas Co., 3600 E. Third St., Amarillo, Tex. (Correction—cost). CD 4/30, under CA.

Texas Gulf Constr. Co., P.O. Box 661, Houston, 1, Tex., CA, **$785,000**, CHURCH incl. sanctuary and educational bldg., GALVESTON, TEX. First Baptist Church, 822 Tremont St., Galveston, Tex. Bids Aug. 14. CD 8/21, under LB.

Tellepsen Constr. Co., 1710 Telephone Rd., Houston, Tex., CA, **$119,425**, PLANT addn., HOUSTON, TEX. The A-1 Bit & Tool Co., Rocks Rd., Houston, Tex. CD 9/8/52.

American Smelting & Refining Co., Deferated Metals Div., 9000 Market St., Houston, rejected bids Mar. 27, PLANT, HOUSTON, TEX. Over **$150,000**. Project dormant. CD 3/21.

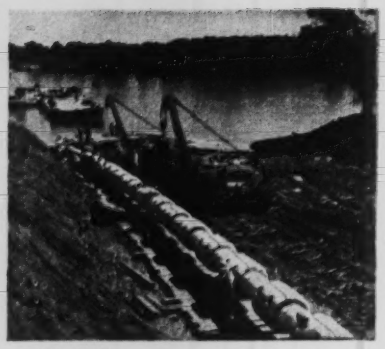
Marshall Constr. Co., 4009 Center St., Houston, Tex., LB, **$370,800**, Durkee Elementary SCHOOL, HOUSTON, TEX. Houston Independent School Dist., 1600 Washington St., Houston, Tex. Bids Aug. 20. Geo. & Abel B. Pierce, 2200 Welch St., and M. McGinty, 2425 Ralph St., Houston, Tex., archts. CD 7/28.

Pence Constr. Corp., Box 226, Houston, Tex. LB **$85,000**. 50x385 ft., steel WAREHOUSE addn., HOUSTON, TEX. Wm. Cameron & Co., Inc., 1902 Cullen Blvd., Houston, Tex. Bids Aug. 20. CD 8/5.

Chat. C. Stack, 8812 Humble Rd., Houston, Tex. Own Forces. **$365,000**. 30 DWELLINGS, HOUSTON, TEX. CD 8/17.

▲ **Pasadena Savings & Loan Assn.**, Pasadena, Tex. rejected bids June 25, 5 story BANK and OFFICE, PASADENA, TEX. **$1,000,000**. CD 6/16.

Blaw-Knox Co., Farmers Bank Bldg., Pittsburgh, Pa. CA **$175,000**, DECARBONIZING UNIT; **$200,000**, CRUDE TOPPING UNIT; **$175,000**, PLATFORMING UNIT, TYLER, TEX. McMurrey Refining Co., Old Longview Rd., Tyler, Tex. CD 6/3.



If it's concrete . . .

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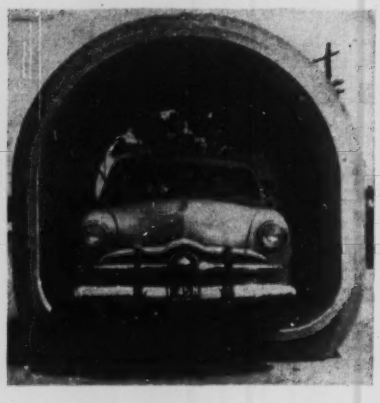
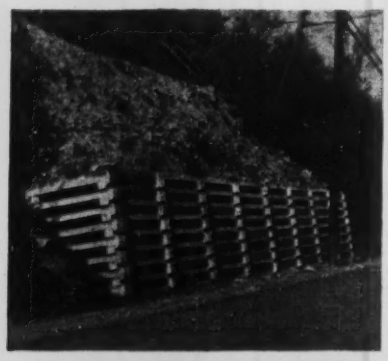
world's largest manufacturer of concrete sewer and culvert pipe

can make it



26 plants for convenient, economical service.

30 years' experience in pipe, cribbing, precast manholes, riverweights, flat base pipe. Name it, we make it!



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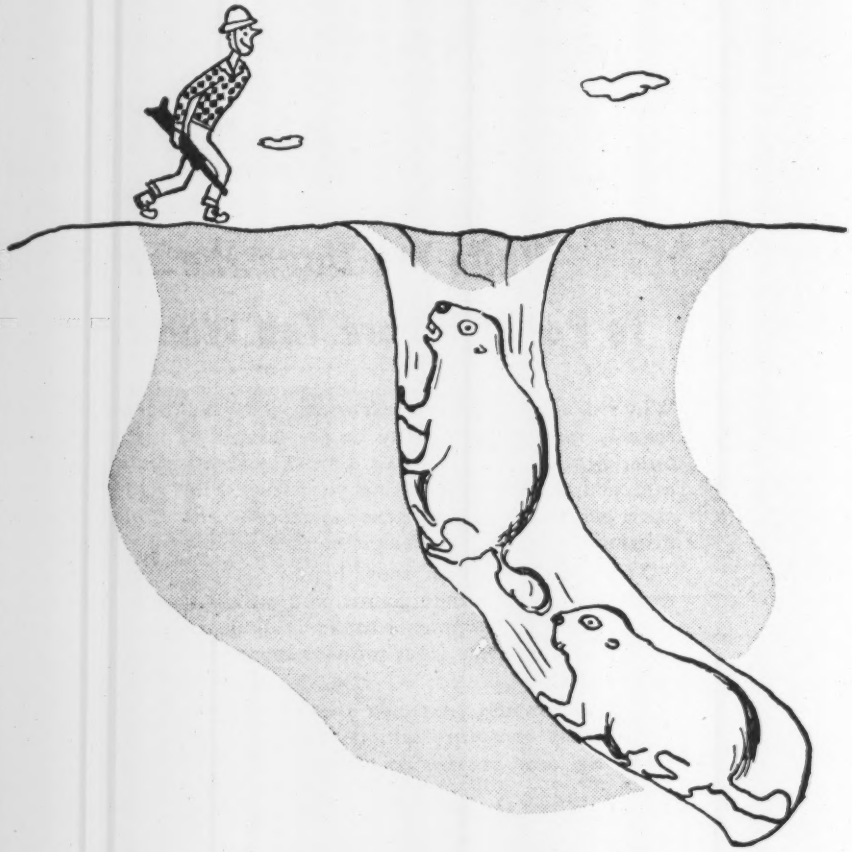
297 South High Street
Columbus, Ohio
Publishers of Famous "Pipe Dreams"



Let's get out of here, Mo. He's got his *Atlantic Pneumatic Pipe Driver* with him!

Send for Booklet 2, and let us explain how quickly the **Atlantic Pneumatic Pipe Driver** pays for itself.

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Since 1918 . . . Always First with the Finest!
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FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

† Washington—B.A. 9/22—Bureau Reclamation, Dpt. Interior, Ephrata, earth canal lining West Canal, fourth section, Columbia Basin Proj. Spec. DC 3018. L. N. McClellan, Bldg. 1 A, Denver Federal Center, Denver, Colo., ch. engr.

† Calif., San Diego—OFF-SITE UTILITIES—B.A. 9/29—Eleventh Naval Dist., 1220 Pacific Coast Hy., San Diego, off-site utilities and access road to Title VIII Proj., NOY 78547, Spec. 38933, $200,000. Plans deposit $40.

† Washington—B.A. 10/6—Bureau Reclamation, Dpt. Interior, Ephrata, earthwork, pipe lines, structures Eltopia Branch Canal and North Part Unit P-9, laterals, sublaterals, and wasteways, Potholes East Canal Laterals, Columbia Basin Proj., west of Eltopia, Spec. DC 4030. W. A. Dexheimer, comm.; adv. ENR 9/10.

HEAVY CONSTRUCTION
LOW BIDS AND CONTRACTS

† IDAHO—Bureau P. Rds., Dpt. Commerce, 609½ Bannock St., Boise,
Wangsgaard Constr. Co., Bountiful, Utah, CA, $263,628 clearing, grubbing, grading, drainage 12. mi. Boundary Creek-Stagger Inn Rd., Boundary Co. Bids Aug. 21. CD 8/12.

IDAHO—State Hy. Dpt., Boise,
Asphalt Paving & Constr. Co., 3206 Pleasanton Ave., Boise, Idaho, CA, $343,851, roadway, 4-lane plant mix surf. 1.952 mi. Old Oregon Trail between Cole School and Fairgrounds, Ada Co.; CA $152,853, plant mix bit. surf., wid'n, 31.2 ft. concrete bridge, U.S. 30, from New Plymouth west, Payette Co. Bids Aug. 18, awarded Aug. 20. CD 8/10.

IDAHO—State Hy. Dpt., Boise,
Aslett Constr. Co., Twin Falls, Idaho, CA, $71,874 roadway, roadmix bit. 4.167 mi. Base line Road from Gannet west, Blaine Co. Bids Aug. 18, awarded Aug. 20. CD 7/30.

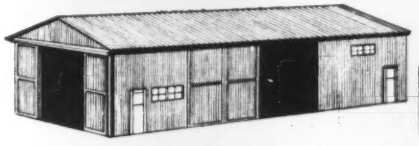
WASHINGTON—State Hy. Dpt., Olympia,
Fiorito Bros., 1100 Leary Way, Seattle, Wash., CA, $343,819, c. conc.-b. conc. 3.089 mi. Hy. 1, Chicken Coop Inn to Kalama River, Fed. Aid, Cowlitz Co.;
McAtee & Heathe, P.O. Box 4083, Station B, Spokane, Wash. CA, $82,222. non-skid single seal and bit. 39.28 mi. Gloyd Loop Rd., Grant Co. Bids Aug. 25. CD 8/12.

▲ **Odegard Constr. Co.**, 2417 Hewitt Ave., Everett, Wash., LB, $1,321,554, five 80,000 bbl. welded steel tanks for aviation gas and jet fuel storage, U.S. Naval Supply Depot with handling facilities, Spec. 40761 MANCHESTER, WASH. P. Wks. Officer,

(Continued on page 125)

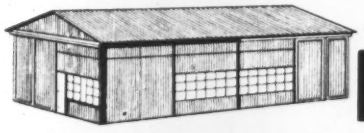
VERSATILE STEEL BUILDINGS

Portable or Permanent • Styles for all Utility Purposes



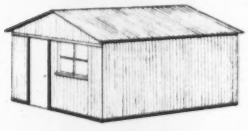
40 Foot Span
14 Feet Clear Height

A heavy duty, all steel general purpose building designed for use as a single building or as multiples in width. Any length may be obtained in multiples of 20'. Structure is of heavy gauge formed steel frame with box corrugated sheet side panels and roofing. Access doors, and sliding truck doors may be placed at several different locations and single or multiple sash may be located on two levels as shown. Patented "clip and wedge" assembly method assures easy erection and 100% salvage if dismantled.



26 Foot and 30 Foot Span
10 and 12 Feet Clear Height

Similar to the above building except designed in two standard widths, two heights and for length extension in multiples of 13'-6". Buildings may be used singly or in multiples joined at the eaves. Six standard types of interchangeable wall panels give full flexibility for location of access doors, truck doors, sash and solid panels. Same easy erection, sturdy construction and 100% salvage-ability in case of dismantling.



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10 x 12 Feet and Longer

Same sturdy, all steel construction on a smaller scale for tool houses, yard offices, etc. Full 7'-6" headroom and additional length in multiples of 2'. Choice of four end wall panel designs. Interior partitions available.

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PRODUCTS — Hollow Metal Doors • Prefabricated Metal Buildings • Window Wells
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save both by serving your men plenty of cool, refreshing water on the job

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- **HELPS REDUCE ACCIDENTS** due to heat and fatigue.
- **AIDS EFFICIENCY . . .** the men work refreshed.
- **CHECKS CONTAGION, ABSENTEEISM.** It's individual service.

Dixie Safety Slogans will help your men become more safety conscious.

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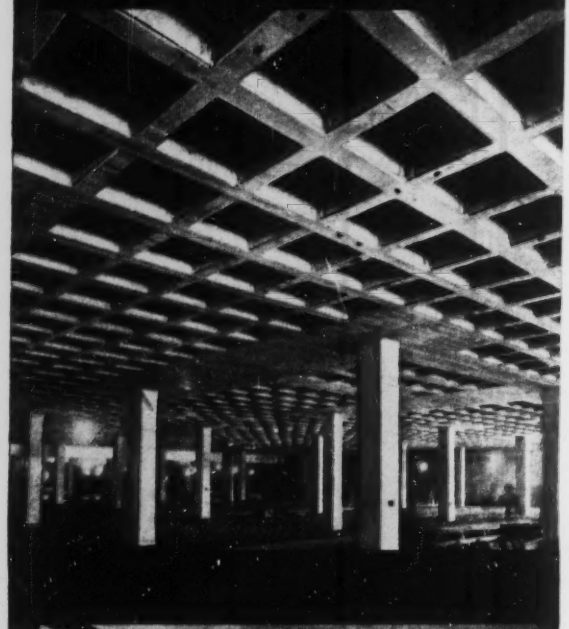
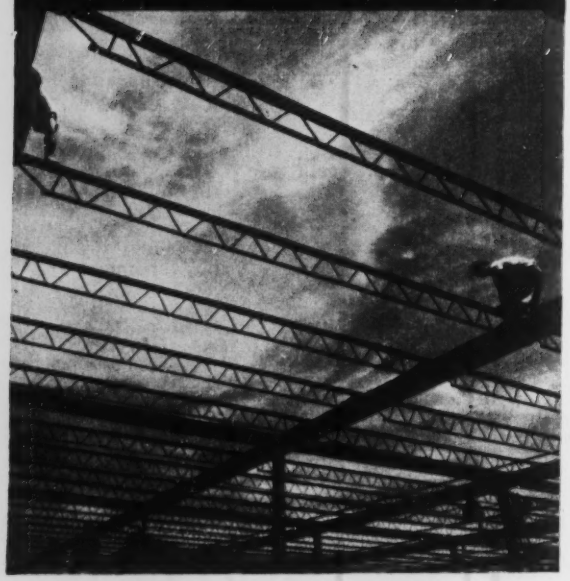
Easton, Pa.





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savings with Ceco's joist construction

Any way you figure it, joist construction is the most economical way to build floors and roofs. And Ceco offers two types—both fire-resistive—both engineered for economy. They are Steel Joist Construction and Meyer Steelform Concrete Joist Construction. Occupancy requirements, availability of labor and material and other factors will guide the architect and engineer in selecting the most favorable type of joist construction for each project.

Ceco concrete joist construction

Here you can expect savings over solid slab and other heavier types of concrete construction, because less steel, concrete and lumber are used . . . less labor too. Meyer steelforms are reused at a nominal rental fee.
Murphy & Mackey, architects, saved $50,000.00 by using concrete joist construction instead of solid slab in the Bishop DuBourg High School, St. Louis, Missouri.

Ceco steel joist construction

Because there is less weight in steel joist construction . . . supporting beams, columns, and footings are lighter.
The self-centering feature eliminates formwork and shores.
Architect Harry Owen Bartlett used Ceco steel joists in the design of Remington Rand's new Chicago office building to reduce column loads and effect major savings.

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(Continued from page 123)

Thirteenth Naval Dist., 1611 W. Wheeler St., Seattle, Wash. Bids Aug. 25. CD 7/29.

† **Mowat Bros. Constr. Co.,** 2833 Eastlake Ave., Seattle, Wash., CA **$610,000,** 1 story, 120x300 ft. electronics bldg., for Boeing Airplane Co., SEATTLE, WASH. Dpt. Air Force, The Pentagon, Wash., 25, D. C. Bids July 30. CD 8/11, under LB.

† **Rudd Constr. Co.,** Peyton Bldg., Spokane, Wash., LB **$694,687,** 14,000 sq. ft. frame bldg. for squadron operations and 6900 sq. ft. frame bldg. for squadron maintenance, Fairchild Air Force Base, Inv. 54-14, SPOKANE, WASH. U.S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Aug. 18. (Correction—low bidder) CD 8/25, under LB.

▲ **American Bridge Co., Div. U. S. Steel Corp.,** 208 S. LaSalle St., Chicago, Ill., LB **$2,186,913,** superstructure;

Cascade Contractors & Austin Constr. Co., Terminal Sales Bldg., Portland, Ore., LB **$676,307,** substructure for Bridge across Columbia River, MC NARY, ORE. Umatilla Co., Court House, Pendleton, Ore. Bids Aug. 25. CD 7/27.

Concrete Construction Service, 16820 S. Figueroa St., Gardena, Calif., LB, **$157,026,** bridges over Bull Creek Channel at Saticoy St., Sherman Way and Van Owen St., LOS ANGELES, CALIF. City Bd. P. Wks., City Hall, Los Angeles, Calif.

George Savala, 541 S. Spring St., Los Angeles, Calif., LB, **$63,480,** street imprvs. and storm drains in Nichols Canyon and Cruz Rds., LOS ANGELES, CALIF. City, Bd. P. Wks., City Hall, Los Angeles, Calif.

BUILDINGS

LOW BIDS AND CONTRACTS

W. G. Clark Co., 408 Aurora Ave., Seattle, Wash., CA, est. **$300,000.** 3 story, rein.-con. East EXCHANGE ADDN., SEATTLE, WASH. Pacific Telephone & Telegraph Co., Telephone Bldg., Seattle 1, Wash. Bids Aug. 21. CD 8/13.

▲ **M & K Corp., and Frederickson & Watson Constr. Co.,** 200 Financial Center, San Francisco, Calif., CA, **$1,626,000,** 6 story concrete OFFICE, 801 Capitol Ave., SACRAMENTO, CALIF. State Div. Architecture, P. Wks. Bldg., Sacramento, Calif. Bids Aug. 18, awarded Aug. 21 CD 8/25, under LB.

CANADA

BIDS ASKED—BUILDINGS

N. B. Moncton—WAREHOUSE, etc.—Bids Asked—Goodyear Tire & Rubber Co. of Canada Ltd., New Toronto, Ont., 3 story, bsmnt., 114x126 ft., steel, concrete warehouse and office, St. George and Tenth Sts., Luke & Little, 1515 Crescent St., Montreal, Que., archts.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Glencoe Engineering & Constr. Co. Ltd., Krege Bldg., Calgary, Alta., CA, **$550,000,** 60 multiple dual purposes HOUSES, Royal Canadian Air Force Base, PENHOLD, ALTA. Central Mortgage & Housing Corp., Kensington Bldg., Winnipeg, Man. Bids July 3, awarded Aug. 20. CD 6/26.

W. H. Yates Constr. Co. Ltd., 400 Wellington St. N., Hamilton, Ont., CA **$150,000,** 8-bay garage, R.C.A.F. Station, CAMP BORDEN, ONT. Defence Constr. Ltd., 40 Eglinton Ave. E., Toronto, Ont. Bids Aug. 6. CD 7/22.

M. J. Storm & Co., Fort Erie, Ont., CA, **$33,821** water mains in Branscombe Subdivision, FORT ERIE, ONT. Municipality, Fort Erie, Ont. C. R. Hagey Eng. Co., Ltd., Riverview Apartment, Fort Erie, Ont., engrs.

Carter Construction Co. Ltd., 419 Cherry St., Toronto, Ont. CA, **$180,000,** railway subway at Dufferin and Dupont Sts., TORONTO, ONT. Canadian Pacific Ry. Co., T. A. S. Mumford, engr., 327 Union Station, Toronto, Ont. Awarded Aug. 24.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Alldritt Constr. Co.,** 10340 12 St., Edmonton, Alta., Owner Builds. **$1,250,000.** 148 HOUSING Units, 85 St. between 93 and 95 Aves., EDMONTON, ALTA. CD 6/13/51.

Pigott Construction Co., Ltd., 36 S. James St., Hamilton, Ont., CA, **$400,000,** concrete, steel, masonry PLANT, DUNDAS, ONT. Dolosite Refractories Ltd., Dundas, Ont.

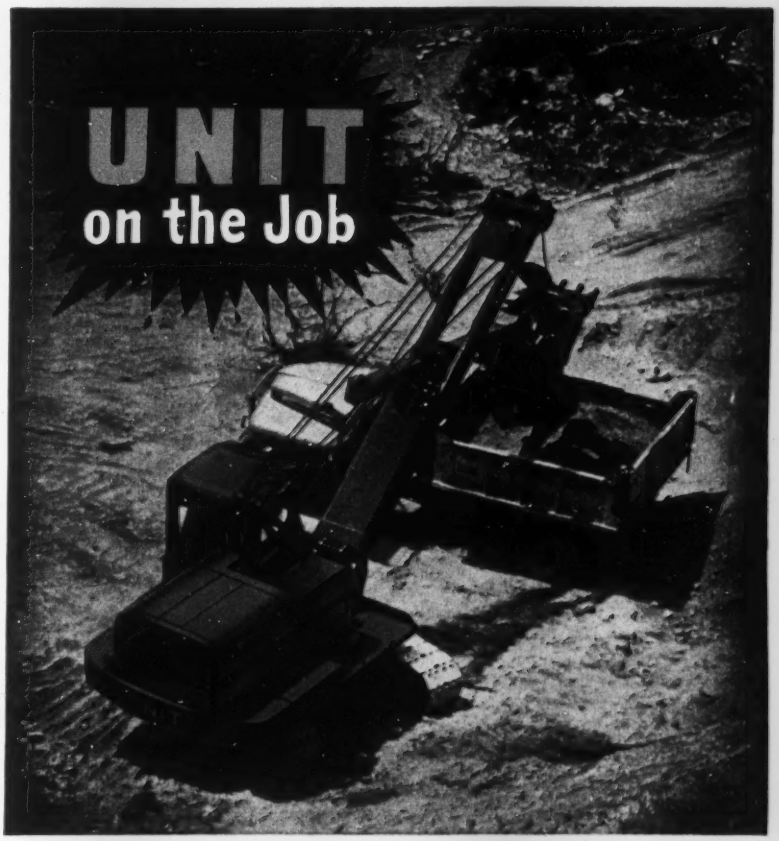
▲ **Pigott Construction Co. Ltd.,** Pigott Bldg., Hamilton, Ont., CA, total est. **$1,000,000** foundation contract for process blast furnace slag PLANT, HAMILTON, ONT. National Slag Ltd., Beach Rd., Hamilton, Ont. Awarded Aug. 26. CD 7/7.

Sterling Constr. Co. Ltd., 2494 Sandwich St. E., Windsor, Ont. CA Approx. **$700,000.** Central HEATING PLANT (Army) Job 2446, LONDON, ONT. Defence Constr. Ltd., 40 Eglinton Ave. E., Toronto, Ont. Bids July 21. CD 7/1.

▲ **Dominion Bridge Co. Ltd.,** Lachine, Que., CA, **$1,000,000** structural steel for FACTORY, MILLHAVEN, ONT. Imperial Chemical Industries Ltd., London, England.

▲ **Louis Donolo (Ontario) Ltd.,** 631 Rogers Rd., Toronto, Ont., CA, **$1,000,000,** 6 story OFFICE, 85 Bloor St. East, TORONTO, ONT. Household Securities Ltd., 80 Richmond St. W., Toronto, Ont. Bids Aug. 18, awarded Aug. 25. CD 8/7.

Economy Home Builders of Windsor Ltd., Curry Ave., Sandwich W. Township, Windsor, Ont., CA, **$300,000** 60 low cost rental houses in housing development, WINDSOR, ONT. City, City Hall, Windsor, Ont. H. C. Beckett, 52 Chatham St. W., Windsor, Ont., archt. Awarded Aug. 20.



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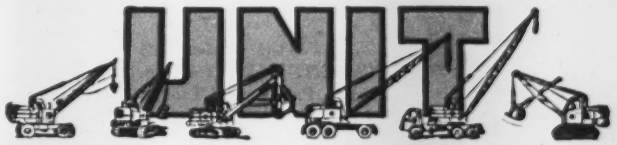

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

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MODEL DD

This all-season portable tail-gate spreader may be mounted on any standard dump body in a matter of minutes. It gives a uniform spreading pattern of 4 ft. to 60 ft. for seal coating in the summer and ice control in the winter. The "DD" spreads uniformly at truck speeds of 1 to 35 m.p.h. in any gear, using sand, salt, cinders, chips or chlorides. Powered by a rugged 2 h.p. gas engine, the "DD" is built to give years of economical service.

HI-WAY SPREADER
MODEL R

This rugged towed-type model spreads forward or reverse at controlled widths. It is available in widths from 8 ft. to 13 ft. and HI-WAY's unique baffle system gives complete spreading range from 1 ft. to maximum. The Model "R" is equipped with a swivel-type, self-coupling hitch that can be raised or lowered by a convenient control handle. Its feed roller, treaded with right and left spirals—give a positive grip so as to permit handling a greater range of materials from fine sand to crushed rock.

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MANUFACTURERS OF THE "CEMENT GUN"

▲ **Walter G. Hunt Co. Ltd.**, 1405 Bishop St., Montreal, Que., CA, $1,350,000, R.C.N. ARMAMENT DEPOT, Job 2455 LONGUEVIL, QUE. Defence Constr. Ltd., 1247 Guy St., Montreal, Que. Bids July 28. CD 7/7.

Corinthian Constr. Co. Ltd., 5726 Sherbrooke St. W., Montreal, Que., CA, $200,000, WAREHOUSE and OFFICE on Upper Lachine Rd., MONTREAL, QUE. Lyman Tube & Supply Co., Ltd., 920 St. Sophie Lane, Montreal, Que. Ross, Patterson, Townsend & Fish, Dominion Square Bldg., Montreal, Que., archts.

Decarie Constr. Ltd., 1540 Beauregard St., Ville Jacques Cartier, Que., LB, $350,000, SCHOOL, Hubert St., in Greenfield Park, MONTREAL, QUE. School Comm. of Greenfield Park. J. C. Savage, secy., Montreal, Que. Morin, Cing-Mars, 84 Notre Dame St. W., Montreal, Que., archts.

▲ **Canadian Bechtel Ltd.**, 25 King St. W., Toronto, Ont., CA, $10,000,000, expansion and modernization at REFINERY, MONTREAL EAST, QUE. Imperial Oil Ltd., 56 Church St., Toronto, Ont. CD 7/20.

Bendke Constr. Co., Lloydminster, Sask., CA, $300,000 — 30 HOUSES, PRINCE ALBERT, SASK. Central Mortgage & Housing Corp., 400 Kensington Bldg., Winnipeg, Man. Bids June 18. CD 6/15.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska**—B.A. 9/15—Bureau Reclamation, Dpt. Interior, Bldg. 1A, Denver Federal Center, Denver, Colo., two 66 in. butterfly valves for Eklutna Power Plant, Eklutna Proj., Spec. DS 3716. Extended date. L. N. McClellan, c/o owner, ch. engr. CD 8/13.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲† **S. Birch & Sons and Lytle & Green**, Securities Bldg., Seattle 1, Wash., CA, $7,230,323, est. $8,495,587 hardstands, taxiways and hydrant refueling facilities, Inv. 53-86, Elmendorf Air Force Base, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Aug. 12. CD 8/18, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **S. Patti Constr. Co. & Mac Donald Constr. Co.**, 1340 Admiral Blvd., Kansas City, Mo., CA, $2,480,000. GYMNASIUM and AUDITORIUM addn. to high school, ANCHORAGE, ALASKA. School Bd., Anchorage, Alaska. Bids Aug. 21. CD 8/31, under LB.

Proposed Projects——

WATER SUPPLY

Colo., Frederick—Town, water supply system, $107,000 Wilson & Co., 20 E. 9 Ave., Denver, consult. engrs. and archts. CD 8/10.

Massachusetts—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston, furnish, suspend 24 in. water mains under new Hunt's Falls Bridge across Merrimac River, Lowell, $172,000.

Mass., Lawrence—City, Joseph R. Turrisi, dir. Eng., City Hall, water-sys., mains, relining, cleaning, servicing 2 new housing projs. $600,000, Pitometer Co., 1461 Western Ave., Albany, N. Y., consult engr.

Mo., Harrisonville—City, water sys. Imprvs. $200,000.

Mo., Webster Groves (St. Louis 19 P.O.)—City, John H. Cassidy, mayor, City Hall, 4 E. Lockwood Ave., Zone 19, $400,000 bond election Nov. 3, water sys. distr. mains, incl. mains, pumping stations, $471,000, Horner & Shifrin, Shell Bldg., 1221 Locust St., St. Louis, Zone 3, consult. engrs. CD 7/22.

▲ **Mont., Billings**—City, City Hall, voted $2,450,000, bonds, imprv. water sys., 4 new reservoirs, several pumping stations, addns. to water plant, addnl. water mains, Black & Beatch, 4706 Broadway, Kansas City, Mo., consult. engrs. CD 6/26.

Neb., Lincoln—City, expansion of wells, $217,000, Fulton & Cramer, 922 Trust Bldg., consult. engrs. CD 5/12.

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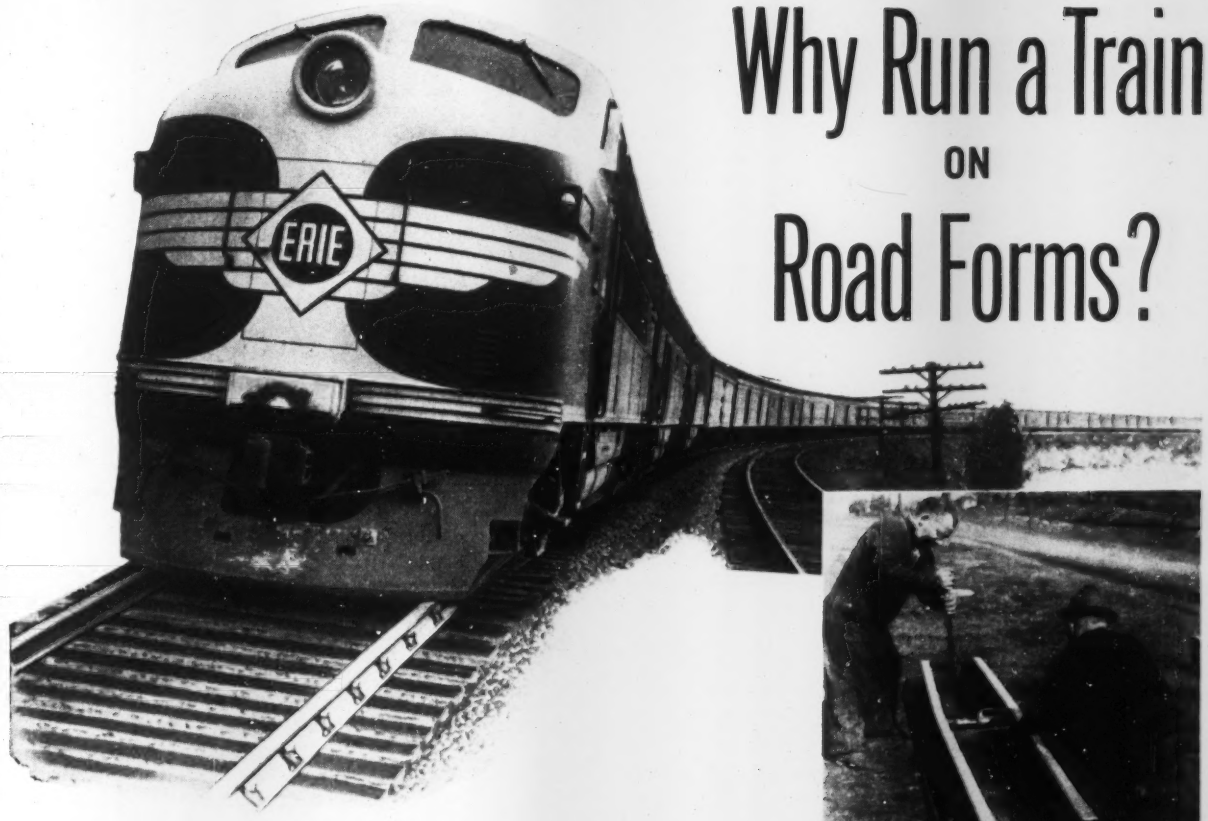
Why Run a Train ON Road Forms?



Super-Strength HELTZEL ROAD FORMS

LAST LONGER—REDUCE MAINTENANCE

Heltzel believed they built the strongest, most serviceable road form in the world. They decided to submit their form to a series of grueling tests to find out just how much abuse it could take.

First of all, they bolted a Heltzel form to a similar form of another make. Inserting a jack at the center point they applied pressure to compare bending moments. The Heltzel form remained rigid while the other form weakened and bent to the pressure.

Secondly, they put the two forms to an impact test. Two men wielded sledges and alternately attempted to smash the forms apart. Here again the Heltzel form withstood the punishment as the second form was damaged beyond repair.

Finally, they set up two lines of Heltzel forms and backed a loaded freight train over them without a sign of failure.

What does all this prove? Simply that when you buy Heltzel forms you're getting the best that money can buy at no increase in price. A road form must be able to withstand punishment year in and year out, with replacement held to a minimum. That's why Heltzel engineers have gone to such great lengths to design and build and to prove the Heltzel form is the finest ever made.

Let Heltzel prove it to you. It will pay handsome dividends. For additional information, or the name of the Heltzel representative nearest you, write THE HELTZEL STEEL FORM AND IRON CO., WARREN, OHIO.

Write for Bulletin K-19 NOW!

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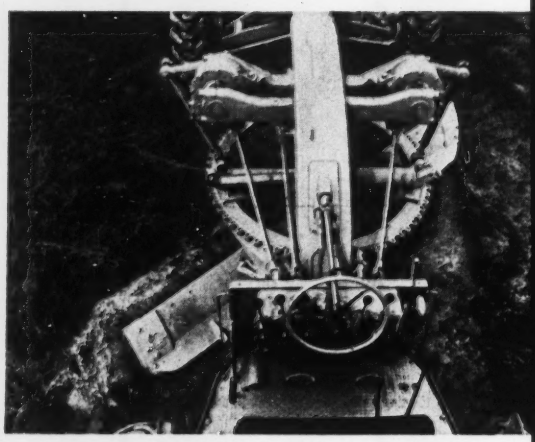
Look at Your Grader Jobs

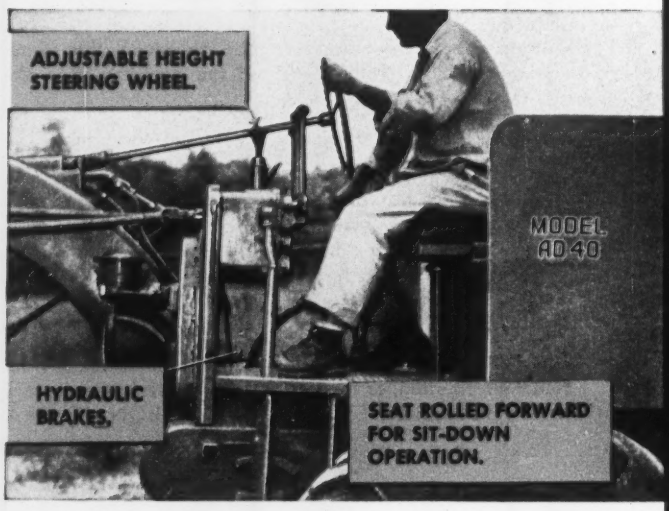
THROUGH THE EYES OF AN **AD-40** OPERATOR . . .

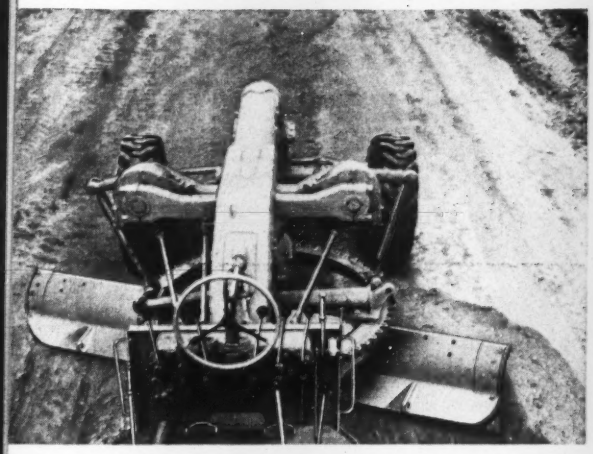
SLOPING— Look how much better you see . . . how much steadier your blade is with small control rods leading out to lift cases located directly over the circle.



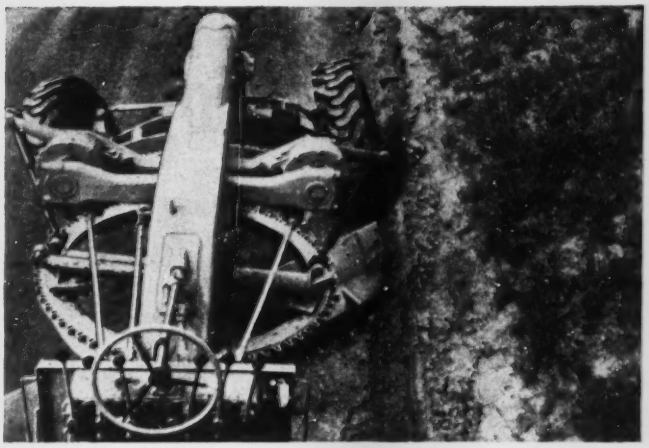
SOD STRIPPING — Look at the tapered corners on this clean, wide platform . . . how they give unequalled view of heel of ROLL-AWAY moldboard.

In addition to letting you see better, the AD-40 offers feather-touch hydraulic power steering, hydraulic brakes . . . and true comfort for any size operator, sitting or standing. *Look!*

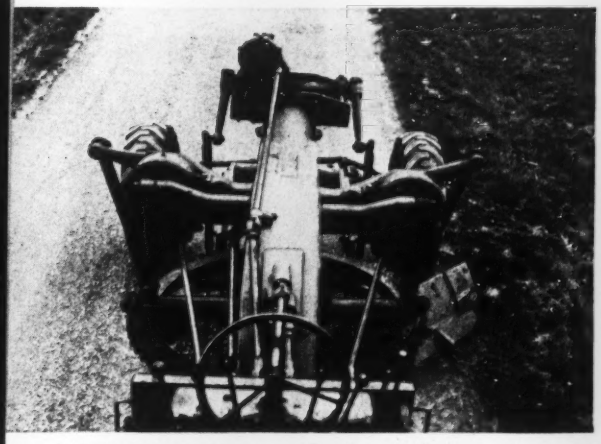




GRADING — Look at that single member frame — it really lets you see what you're doing . . . means efficient grading on *any* job.



DITCHING — Look at the low control panel. It gives you a clear view of the blade . . . helps insure a clean, smooth ditch.



SCARIFYING — Look at the AD-40, even in scarifying, and you will see it means new, better grader visibility at all times.

• 104 bhp. • Six speeds forward, three reverse
• 23,000 lb. (with optional calcium chloride solution in rear tires — 24,800 lb.).

YES, the big, new AD-40 is designed for today's jobs and today's operators . . . brings new standards of performance to all users of motor graders . . . handles all grading jobs faster, better, easier. You owe it to your operators . . . and yourself to ask your nearby Allis-Chalmers dealer now for a demonstration and *see for yourself.*

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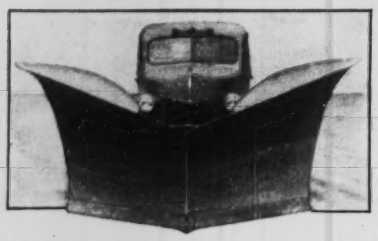
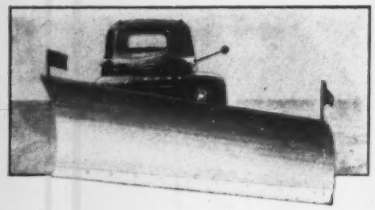


V-PLOW—Extra heavy construction, interchangeability, direct lift, long-wearing shoes, feature this model. It's a favorite with State Highway Departments.



ONE-WAY SPEED PLOW—Crimped blade means better aeration, longer throw. Automatic trip, adjustable height casters contribute to this model's popularity.

They are a grand team—these Gledhill Plows! And you're by no means limited to two! There are 23 models and sizes to choose from.

You can deliver "Open Roads" whether main highways or country by-ways, if you equip your snow men with Gledhills.

Performance and satisfaction are such that Gledhill sales grow steadily—year after year.

Send for details so you can order now!

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HEAVY DUTY DOORS with Fingertip Control

KINNEAR Rolling Doors

The curtain of the Kinnear Rolling Door offers the best possible combination of rugged strength . . . modern appearance . . . free coiling, space-saving action . . . and shock absorbing construction. In addition, Kinnear Rolling Doors can be easily controlled by the push of a button, either at the point of entrance or at a central control center. Write for details.

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(Continued from page 126)

N. C., Asheville—Comrs. Buncombe Co., Court House, exten. water sys. into Fairview area. $150,000.

Okla., Bartlesville—City, addnl. water supply. $250,000, J. E. McCormick, Bartlesville, engr. CD 4/11/51.

Okla., Sayre—City, addnl. well water supply, $165,000, Clyde Hatfield, Sayre, engr.

Tex., Alvord—City, addnl. WW sys. imprvs., mains and distr. lines. $102,500. Paul G. Bentley & Assoc., 1100 S. Erway St., Dallas, consult. engrs.

Tex., Plains—City, voted bonds Aug. 11, Job 1 water storage, elevated steel, ground concrete, $40,000; Job 2, expansion and imprv. water mains, distr. liens, $60,000. Cecil M. Hawk & Assoc., 1641 Broadway, Lubbock, consult. engrs.

Tex., Seminole—City, Phase 1, water well field, $260,000; Phase 2, water mains, distr. lines, $200,000; Phase 3, water storage, probably elevated steel, $60,000. H. N. Roberts & Assoc., 1310 Avenue Q, Lubbock, consult. engrs.

Tex., Terrell—City, voted bonds Aug. 18, WW sys. rehabilitation, $35,000; new water mains and distr. lines, $40,000; constr. earthen and concrete type water supply lake dam and water tower, lake to be 4 mi. west of here, covering 950-acres, impound 9,000-acre ft. of water, etc. $500,000. Joe E. Ward Engr. Co., Wichita Falls, consult. engr.

Va., Lynchburg—City, exten. water lines into Chestnut Hills area. $100,000.

▲ Que., La Salle—Town, water pipe line for Lachine limits to new reservoir, $500,000; 3 m.g. reservoir, $925,000.

Que., St. Anne de Chicoutimi—Municipality, WW sys., $400,000. Delisle & Laquerre, 365 Racine St., Chicoutimi, consult. engrs.

SEWERS, WASTE DISPOSAL

Ill., Morton—Village Hall, sewage treatment works, $400,000. Crenshaw & Jost, 512 Court St., Pekin, consult. engrs. CD 11/30/50.

Ind., Portland—City, sewers and sewage plant, $500,000 or more. CD 2/13/46.

Mich., Frankenmuth—Village, N. L. Keinnath, supt. P. Wks. Dpt., sewage disposal plant, treatment facilities, $500,000, Greeley & Hanson, 220 N. State St., Chicago, Ill., consult. engrs.

▲ Mich., Livonia—City, Marie W. Clark, main trunk line sewer and pumping station, 19,700 ft. main trunk sewer east and west on Lyndon Ave. between Inkster and Farmington Rds., $1,811,500, Herald F. Hamill, 203 Conner Bldg., Plymouth, engr.

Mich., Manistique—City, A. Robertson, clk., sewerage sys., sewage pumping station, interceptors, force main, collecting sewers, incl. river crossing and sewage disposal plant treatment facilities, $475,000. Francis Eng. Co., 307 Eddy Bldg., Saginaw, consult. engr.

Mich., Norway—City, sanitary sewers, $255,000; combined sewers, $90,000; storm sewers, $55,000, sewage disposal plant, $230,000. The Francis Eng. Co., 301 Eddy Bldg., Saginaw, consult. engr. CD 11/13/44.

Mich., Wakefield—Village, sewage disposal plant, $200,000, sewers, $375,000. The Francis Eng. Co., 301 Eddy Bldg., Saginaw, consult. engr.

Mo., Harrisonville—City, sewerage sys. imprvs. $250,000. CD 7/28/44.

N. C., Mount Airy—City, sanitary sewer imprvs. $150,000, J. N. Pease & Co., 1194½ E. Fifth St., Charlotte, consult. engrs. CD 3/6.

O., Campbell—Village, Michael J. Kovach, mayor, $800,000 bond election Nov. 3, sewage disposal plant and collection sewers. CD 11/11.

O., Sylvania—Village, $145,000 bond election Nov. 3, sewage disposal plant, H. A. Stepleton, Colton Bldg., Toledo, consult. engr. CD 9/30.

Okla., Del City—City, sewage disposal plant $400,000, H. V. Becker, 1711 N.W. 14 St., Oklahoma City, engr.

Tex., Bonham—City, 1 m.g. sewage disposal plant, $170,000; sanitary sewer lines, $60,000. Wisenbaker, Fix & Assoc., Tyler, consult. engrs.

Tex., Grand Prairie—City, sanitary sewers, $70,000; storm sewers, $62,500. C. P. Ballard, city engr. CD 5/15.

Tex., Houston—Briargrove Development Co., 5500 Westheimer St., storm sewer, $85,000; sanitary sewers, $90,000, 1 mi. beyond Briarcroft Addition.

Tex., Plains—City, voted bonds Aug. 11, Job No. 3, sewage disposal unit, $60,000; Job No. 4 sanitary sewer collection lines, $65,000. Cecil M. Hawk & Assoc., 1641 Broadway, Lubbock, consult. engrs.

Tex., San Antonio—H. B. Zachry Properties, Inc., c/o Transit Tower Bldg.; plans by Herman & O'Donnell, Mining Exchange Bldg., Denver, Colo., sanitary sewers, $66,500; storm sewers and drainage, $60,000, for Unit No. 1, adjacent to Northridge Park, off Military Hy. Mitchell & Hunt, Transit Tower Bldg., consult. engrs.

Tex., Terrell—City, voted bonds Aug. 18, sanitary sewer collection lines and sys. rehabilitation, $65,000; sewage disposal plant enlargement, $100,000; storm sewers and drainage, $60,000.

BRIDGES

Tex., Sherman—City, Mulberry Street, underpass, $545,000. CD 10/22.

(Continued on page 132)

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"The job called for more tonnage than we'd ever moved before so we picked the EIMCO 104 and it did everything you said . . ." Yes! when you need fast efficient loading you can't beat an EIMCO. In rock, clay, sand, gravel or any combination of these materials the 104 will dig and load between 350 and 450 tons per hour — given sufficient haulage equipment.

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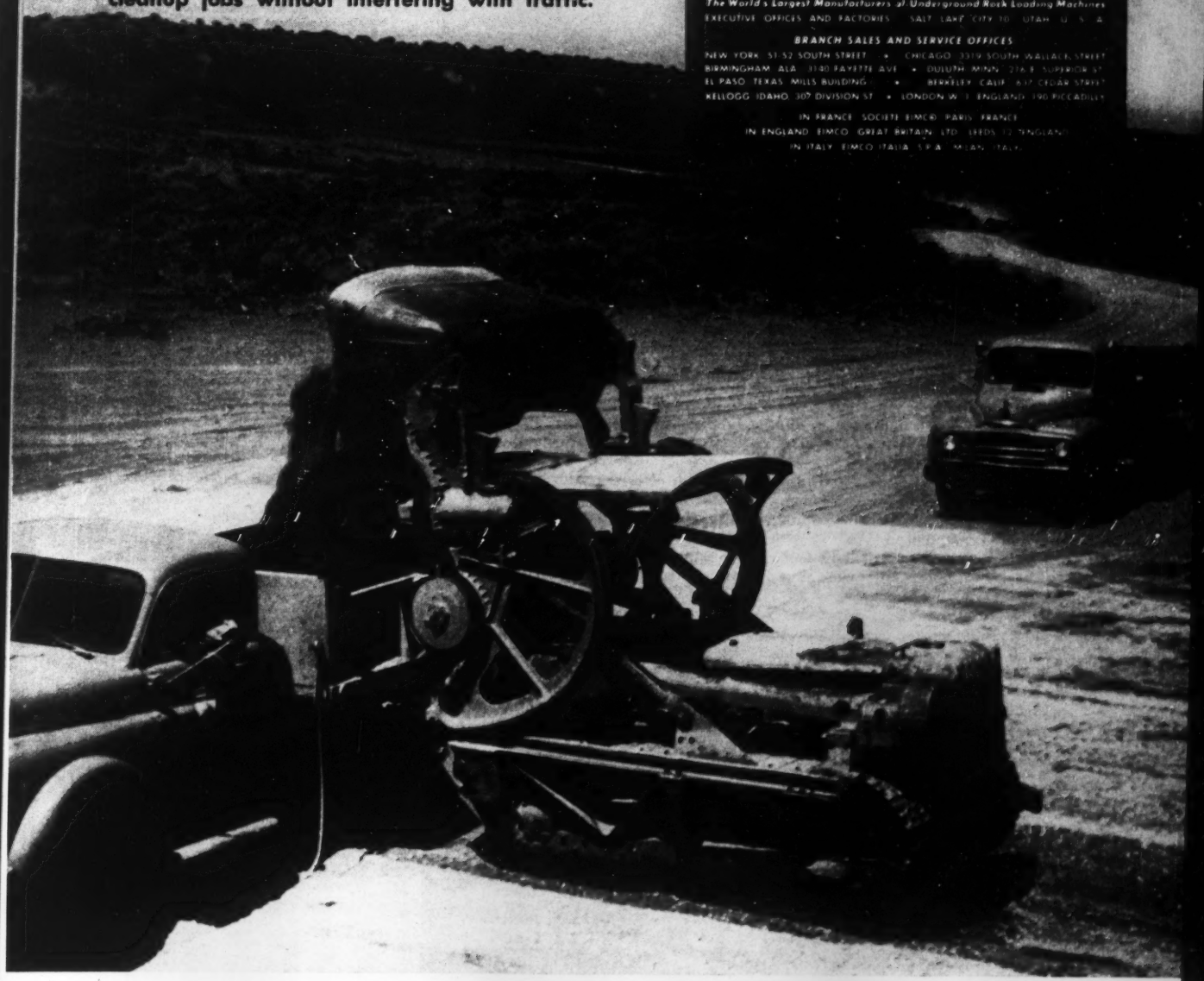
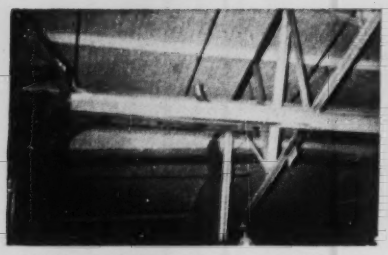
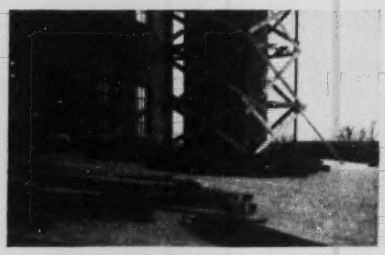




Wolmanized paper machine room roof deck at Wisconsin Rapids. 15 years old, this roof deck is still in like-new condition.

Wolmanized stock chest, platform, stairs and rail built in 1933. This installation is still in good condition and daily service.



View of the base of one of two vomit stacks and roof deck of blow pit building. Wisconsin Rapids plant, over 15 years ago.

Consolidated's Wisconsin Rapids, Wisc., plant used long-lasting Wolmanized Douglas Fir for machine room roof decking.

How Wolmanized* Pressure-Treated Lumber serves a wet process industry

Consolidated Water Power and Paper Co., Wisconsin Rapids, Wisc., is very conscious of water's decaying effect on untreated wood. In a wet process such as theirs, ordinary untreated lumber would soften in a matter of months. Therefore, Consolidated selected Wolmanized pressure-treated lumber for a variety of applications in their plants at Wisconsin Rapids, Biron, and Appleton, Wisc.

The illustrations show how Consolidated used Wolmanized pressure-treated lumber throughout its plants back in 1938. Machinery room roof decks, vomit stacks, stock chests, blow pit roof decks, platforms, are only a few of the uses to which Wolmanized lumber was put. The fact that these installations are still in service after fifteen years' exposure to water, dampness, and moisture testifies to the lasting rot and decay resistant qualities of Wolmanized pressure-treated lumber.

Wolmanized pressure-treated lumber, besides giving protection against rot and decay, is clean, nonoily, odorless, completely paintable, and noncorrosive to metal fittings. Since Wolman* preservative solutions are driven deep into the fibers of the wood by high pressures, and not just brushed on or soaked in, the protection afforded by Wolmanized lumber lasts many times longer.

Wolmanized lumber is completely available with preservative plants and warehouses located throughout the entire country. Learn how you can protect the investment you make in wood structures. Write to:

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PRODUCERS OF THE ORIGINAL

Wolmanized PRESSURE TREATED **Lumber**

(Continued from page 130)

STREETS AND ROADS

▲ **MASSACHUSETTS**—Commonwealth of Mass., Dpt. P. Wks., 100 Nashua St., Boston,
Boston—express hy.-tunnel under South Station (R.R.) links Central Artery and parking facilities, $5,000,000.
Lynn and Revere—Lynnway hy.-General Edwards Bridge Lynn Shore Dr. $3,600,000, Edwards, Kekey & Beck, 80 Federal St., Boston, consult. engrs.
N. C., Asheville—City, 1954 street imprvs., $191,000.
N. C., Charlotte—City, 1954 street imprvs., $400,000. CD 12/19.
N. C., Durham—City, 1954 street imprvs. $200,000.
N. C., Fayetteville—City, 1954 street imprvs., $106,000. CD 3/11/52.
N. C., Raleigh—City, 1954 street imprvs. $181,000.
N. C., Wilmington—City, 1954 street imprvs. $122,000.
O., Cuyahoga Falls—City, $159,000 bond election Nov. 3, street imprvs., sanitary sewers, sidewalks, etc.
▲ **O., Fremont**—City and Sandusky Co., Belt line to incl. grade separations at 3 railroad crossings, partial separations at major hy. intersections, four-lane bridge over Sandusky River to bypass Fremont in semi-circle west and north of city, $6,349,500, Consoer, Townsend & Assoc., 351 E. Ohio St., Chicago, Ill., consult. engrs.
Tex., Plains—Yoakum Co., Plains, road imprvs., incl. grading, drainage, caliche base, penetration asph. surf., little bridge work 24 mi. Precinct No. 1, $240,000; 18 mi. Precinct No. 2, $180,000; 21 mi. Precinct No. 3, $210,000; 16 mi. Precinct No. 4, $160,000. Hasle & Green, Box 1139, Wilson Bldg., Lubbock, consult. engrs. CD 4/30.

AIRPORTS

▲ **N. Y., Idlewild**—HANGAR, etc.—Port of New York Auth., 111 8 Ave., New York, Zone 11, hangar and operations bldg., at New York International Airport, to be occupied by United Airlines, $5,000,000. CD 4/27/44.

LATIN AMERICA

▲ **Mexico**—HOSPITAL, etc.—Srla de Communicaciones y Obras Publicas (Communications & Public Works Ministry), Mexico City, plans by Carlos Lazo, c/o owner, 250-bed hospital and two specialized pavilions for employees, $1,000,000.

PUBLIC BUILDINGS

Ala., Brewton—SHIRT PLANT—City, City Hall, shirt plant, $175,000.
Ala., Linden—PLANT—Town plans by Chas. H. McCauley, Jackson Bldg., Birmingham, plant, $100,000. CD 8/12.
Ark., Arkadelphia—HOUSING, etc.—Henderson State Teachers College, Arkadelphia, plans by Whittenberg, Delony & Davidson, Pyramid Bldg., Little Rock, faculty housing, and apartments for married students, $400,000.
Calif., Martinez—SCHOOLS—Martinez School District, Martinez, $532,000 bond election Oct. 20, schools. CD 10/8.
Colo., Aurora—MUNICIPAL—Town, City Hall, bond election Nov. 3, municipal bldg. $300,000.
Conn., East Haven—SCHOOL—Town School Bd. Comn., East Haven, plans by Schilling & Goldbecker, 405 Temple St., New Haven, Brookside-Rockview School, $900,000.
Fla., Arcadia—WARD—Florida State Imprvt. Comn., Caldwell Bldg., Tallahassee, plans by Stefan H. Zachar, 1630 Lenox Ave., Miami Beach, ward bldg. at state hospital, $500,000.
Fla., Chattahoochee—WAREHOUSES—Florida State Imprvt. Comn., Caldwell Bldg., Tallahassee, plans by H. J. Klutho, 9 Ocean St., Jacksonville, 2 warehouses at State Hospital, $300,000.
▲ **Fla., Gainesville**—SCHOOL—Alachua Co. Bd. P. Instruction, Gainesville, bond election Nov. 4, school imprvs. $2,950,000. CD 10/22/51.
Fla., Miami—SCHOOL—Dade Co. Bd. P. Instruction, 275 N. W. 2 St., plans by W. Snyder, 1177 N. E. 79 St., North Miami Elementary School, $305,000.
Fla., Miami—SCHOOL—Dade Co. Bd. P. Instruction, 257 N.W. 2 St., plans by Wm. H. Merriam, 1022 Malaga Ave., Coral Gables, West Miami Junior High School. $750,000.
Kan., Fort Scott—SCHOOL—Bd. Educ. Dist., 55, c/o Raymond C. French, pres., defeated bonds, Junior High School. Total est. $758,000. Williamson, Loebsack & Assoc., 1243 Topeka Ave., Topeka, archts. CD 8/12.
Me., Brunswick—SCHOOL—Town, School Dpt., Maine St., plans by Stevens & Saunders, 187 Middle St., Portland, elementary school, $500,000.
Me., Portland—SCHOOL—City, School Dpt., City Hall, plans by Miller & Beal, Inc., 465 Congress St., Lyman Gordon Elementary School. $300,000. CD 12/9.
Mass., New Bedford—SCHOOL—City, School Dpt., City Hall, plans by William Nelson Jacobs, 438 Park Square Bldg., Boston, Junior High School, West St. $500,000.
▲ **Minn., Brainerd**—SCHOOL—Bd. Educ., H. C. Nordgaard, supt., plans by H. H. Swanson, 500 Sexton

(Continued on page 134)

99 HEILINERS

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BIG earthmoving jobs like the $300,000,000 Garden State Parkway, and big-producing Heiliners just naturally go together. Heiliners combine all the advantages of fast loading, big capacity, plenty of power, high speed, and "tilting floor" positive forced ejection (the simplest and most efficient known!) with a host of other features that pay off in profit on any job.

- **8 HEILINERS for GEORGE M. BREWSTER & SON, INC.** of Bogota, N.J. are operating near Red Bank, N.J., moving over a million yards of sandy clay loam at a rate of 225-cu. yds. per hour per machine. Loading time per unit averages 45 seconds in 60 ft. and the 1200-ft. round trip time average is 3 to 3½ minutes.
- **5 HEILINERS for CONSTRUCTION AGGREGATES CORP.** of New York are moving 112-cu. yds. of sand per hour per unit on the section of the Garden State Parkway south of Morganville. Loading time averages 40 to 65 seconds in 200 ft., and average cycle time for the 8400-ft. round trip is 8 minutes.
- **4 HEILINERS for FRANK STAMATO & CO.,** of Lodi, N.J., are working near Eatontown and in Ocean County where the contractor had to meet a variety of tough conditions ranging from very wet to dry sand and gravel.
- **3 HEILINERS for J. F. CHAPMAN & SON** of Hillside, N.J., have contracts for grading, draining and structures near the north end of the Parkway working in material ranging from rock and shale to sand and gravel.
- **2 HEILINERS for REID CONTRACTING CO.** of Woodbridge, N.J., are operating near Toms River, and have a lot of tough conditions to meet such as a high water table, sand and gravel with clay and new haul roads.

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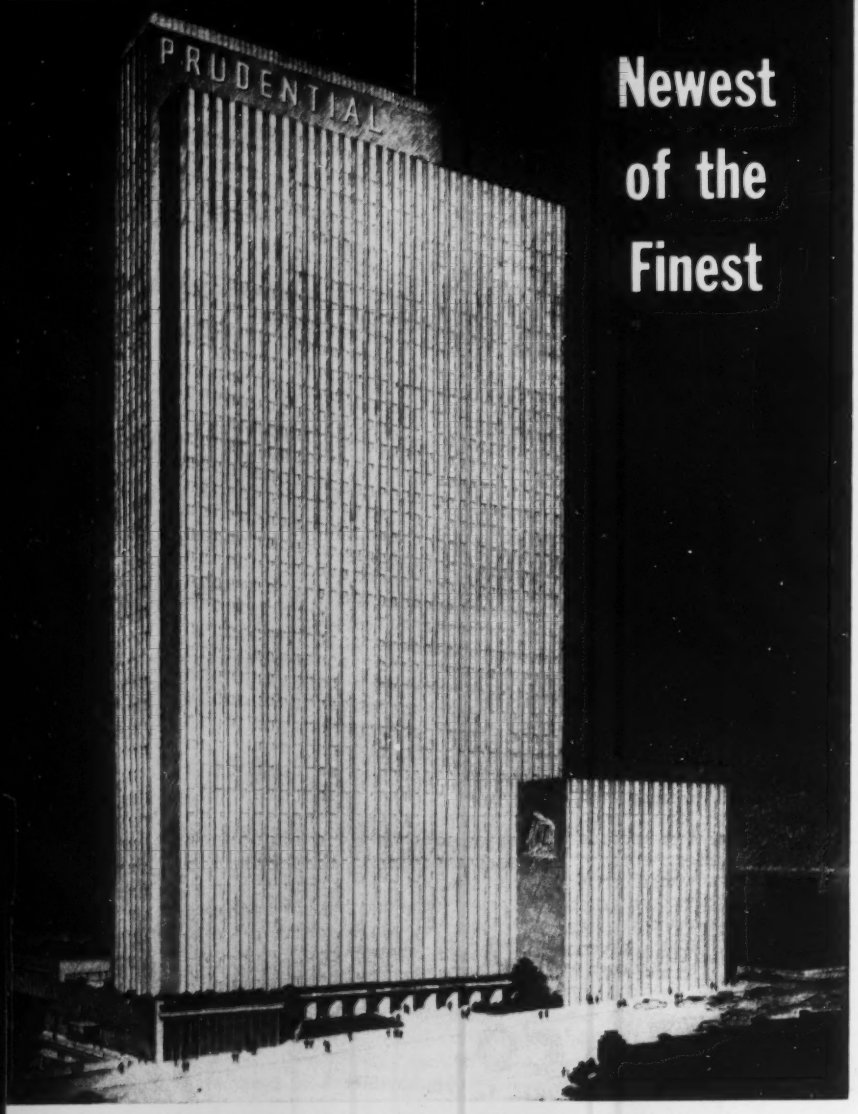
R-20



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The new Prudential Building will soon rise 600 feet above the shore of Lake Michigan, and become a distinguished addition to Chicago's skyline This mid-America headquarters of the Prudential Insurance Company will contain more space than any other office building in America's second largest city

As a building, it will take its place among our country's finest structures and is a perfect example of the features a well-informed investor is willing to put into the space he plans to use and rent. For instance, to prevent future obsolescence and to meet the increasing requirements of modern electronic office equipment, architects Naess & Murphy have prepared the new Prudential Building to handle the highest electrical load of any office building yet built. To do this job easily, and to permit layout changes and additions at minimum cost, Robertson Q-Floor construction is being used This strong, light-weight, steel, cellular structural floor is the only construction material available which provides easy electrical access over every 6-inch area of the entire exposed floor. For more good reasons why fine new buildings all over America have turned to Robertson Q-Floor construction, see the opposite page.

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(Continued from page 132)

Bldg., Minneapolis, 3 grade schools, Junior High School addn. $1,000,000.

▲ **Minn., Brainerd**—HOSPITAL—State, Dpt. Admin., State Capitol, St. Paul, plans by Toltz, King & Day, 1509 Pioneer Bldg., St. Paul, hospital, $1,000,000.

Minn., Howard Lake—SCHOOL—Bd. Educ., F. Munson, clk., plans by Hammel & Green, 608 Turnpike Rd., Minneapolis, school. $600,000.

Miss., Greenwood—PLANT—City, plans by Kelly Gruzen, 744 Broad St., Newark, N. J., plant for Conmar Products Corp. $750,000. CD 8/17.

Mo., Mexico—SCHOOL—Bd. Educ., Mexico, plans by Marshall & Brown, 1016 Baltimore St., Kansas City, school. $750,000.

▲ **N. Y., New York**—SCHOOL—Bd. Educ., 110 Livingston St., Brooklyn, Zone 2, plans by William I. Hohauser Inc., 151 W. 51 St., Zone 18, altering high school, 345-49 E. 15 St. and 326-42 E. 16 St., $1,980,000.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 38, plans by Eggers & Higgins, 100 E. 42 St., Zone 17, slum clearance housing for 2,184 families in nine 14 story apartments on site bounded by W. 3 St., W. Broadway, W. Houston and Mercer Sts. $37,000,000.

▲ **N. Y., New York**—HOUSING—New York City Housing Auth., 63 Park Row, Zone 38, plans by Eggers & Higgins, 100 E. 42 St., Zone 17, slum clearance housing to be called Mary K. Simkhovitch Houses for 1,440 families on site bounded by Spring St., Avenue of Americas, W. Houston St. and W. Broadway. $25,000,000.

N. C., Smithfield—SCHOOL—Johnston Co., Bd. Educ., $750,000 bond election Oct. 3, school imprvs.

▲ **O., Berea**—SCHOOL—Bd. Educ., $3,500,000 bond election Nov. 3, Junior High School, 16-room grade school in Brook Park Village, addn. of gymnasium and swimming pool to Berea High School. CD 11/12/51.

O., Bucyrus—SCHOOL—Bd. Educ., I. J. Miller, supt., school addn. $400,000.

▲ **O., Youngstown**—SCHOOL—Boardman Twp., School Dist., Bd. Educ., Market St., $1,200,000 bond election Nov. 3, school addns., alterations.

Okla., Henryetta—ARMORY—Oklahoma National Guard 2205 N. Central St., Oklahoma City, plans by Bryan Nolen, Oklahoma National Gas Bldg., Oklahoma City, armory, $90,000, vehicle storage bldg., $50,000.

S. C., Camden—SCHOOL—Kershaw Co. Bd. Educ., Camden, Jackson High School. $551,000.

S. C., Pageland—SCHOOL—Chesterfield Co. Bd. Educ., Pageland, Negro elementary-high school. $439,000.

S. C., York—SCHOOL—York Co. Bd. Educ., York, Fairfield Negro School. $300,000.

Tex., Abilene—ARMORY—Texas National Guard, c/o State Bd. Control, Austin, brick, concrete frame and floor slab armory, mostly for storage, $240,000.

▲ **Tex., Austin**—ENGINEERING—University of Texas, Admin. Bldg., plans by Mark Lemmon, supvr. archt., 1210½ Main St., Dallas, and Broad & Nelson, assoc. archts., 205 N. Erwy St., Dallas, expansion of engineering dpt. bldgs. $2,000,000. CD 4/29.

Tex., Baytown—SCHOOLS—Goose Creek Independent School Dist., Baytown, plans by Lowell Lammers, Box 3220, Senior High School expansion, $327,000, H. E. Bovay, Jr., M. Esperson Bldg., Houston, consult. engr.; plans by D. Perkins, 721 E. Texas Ave., Junior High School expansion, $356,000, Miles F. Wortham, 4908 Travis St., Houston, consult. engr. CD 6/13/51.

Tex., Hempstead—COURT HOUSE, etc.—Waller Co., Hempstead, plans by H. Voelcker & Assoc., 1202 Dennis St., Houston, 3 story, 62x128 ft., rein.-con. brick, stone, marble glazed tile and plastered interior court house and jail. $500,000. Chas. V. Chenault, 1202 Dennis St., and George H. Smith, 616 Courtlandt St., Houston, consult. engrs. CD 8-13.

Tex., Katy—SCHOOL—Katy Independent School Dist., Katy, school imprvs., $350,000.

Tex., Odessa—SCHOOL—Ector County Independent School Dist., Odessa, plans by Wilson & Patterson, 202 Major Bldg., Fort Worth, 1 story, masonry high school, $850,000.

Tex., Pharr—ARMORY—Texas National Guard, c/o State Bd. Control, Austin, concrete frame, brick, tile armory mostly for storage, 3-acre tract, $150,000.

Tex., San Angelo—ARMORY—Texas National Guard and State Bd. Control, Austin, plans by John G. Becker, Holcombe-Blanton Bldg., 110x140 ft. masonry, steel armory mostly for storage, $175,000.

Tex., Sweeny—SCHOOL—Sweeny Independent School Dist., Sweeny, plans by Ford, Colley & Tamminga, 3416A Louisiana St., Houston, school. $300,000.

Tex., Vernon—ARMORY—Texas National Guard, c/o State Bd. Control, Austin, masonry type armory,4-acre tract, for Service Battery for 645th Armored Field Artillery. $140,000.

Tex., Waco—SCHOOLS—Waco Independent School Dist., Waco, plans by Walter Cocke, Jr. & Co., 1507 Franklin St., and Gustave R. Olson, coord. archt., P.O. Drawer 27, elementary school, $325,000, CD 5/1; plans by Easterwood & Easterwood, 912 N. Valley Mills Dr., and Gustave R. Olson, coord. archt., P.O. Drawer 27, Bell's Hill Elementary School addn., 2020 Ross Ave., $350,000.

Tex., Wellman—SCHOOL—Wellman Independent School Dist., Wellman, plans by Butler-Brasher Co., 412 Avenue M, Lubbock, concrete, brick, hollow tile, plaster interior school. $300,000. CD 7/29.

▲ **Va., Charlottesville**—SCHOOLS—City, School Bd., City Hall, voted $950,000 bonds Aug. 18, elementary schools on Long St. and Cherry Lane, altering Clarke

and McGuffey Elementary Schools, Lane High School addn. $1,350,000. CD 6/24.

Va., Newport News—SCHOOL—Newport News School Bd., 222 32 St., voted $800,000 bonds, rebuilding Newport News High School. Williams, Colle & Blanchard, 3415 Virginia Ave., archts. CD 1/15.

W. Va., St. Marys—SCHOOL—Bd. Educ. of Pleasant Co., St. Marys, plans by Frampton & Bowers, 312 11 St., Huntington, high school addns., remodeling, $425,000.

Wis., Madison—ARMORY—Wisconsin National Guard, Truax Field, Madison, 2 story, 100x160 ft. armory, $350,000.

Wis., Port Washington—JAIL—Ozaukee Co., Port Washington, plans by Foeller, Schober, Berners, Safford & Jahn, 310 Pine St., Green Bay, jail, $300,000.

COMMERCIAL BUILDINGS

▲ **Ark., West Memphis**—SHOPPING CENTER—Commercial Development Corp., c/o Furbringer & Ehrman, archts., Union Planters Bank Bldg., Memphis, Tenn., shopping center, $1,000,000.

Conn., Stafford Springs—SCHOOL—St. Edwards School, Rev. F. S. Morrisey, Stafford Springs, plans by Alfred Reinhardt, A.I.A., 600 Center St., Manchester, 2 story, masonry school, High St. $300,000.

▲ **Fla., Fort Lauderdale**—SHOPPING CENTER—David Turner & James Dean, c/o Chas. F. McKirahan, archt., Fort Lauderdale, shopping center. $4,500,000.

Ill., Wheaton—HOSPITAL—DuPage County Convalescent Home, Wheaton, plans by Robt. H. Salisbury & Assoc., 213 Wesley Rd., hospital addn., near here, $500,000.

Ind., Upland—HOMES—D. K. Ottinger, R. R. 2, Marion homes in Upland and Grand Co. $300,000.

La., New Orleans—OFFICE—Jefferson Davis Parkway, Doctors Bldg. Co., c/o Curtis & Davis, archts., 822 Perdido St., office. $300,000.

Mo., Springfield—STORE—F. W. Woolworth Co., 3663 Lindell St., St. Louis, branch store. $500,000.

▲ **Neb., Omaha**—HOSPITAL—Clarkson Hospital, 26 St. and Dewey Ave., plans by L. A. Daly Co., Insurance Exchange Bldg., hospital. $3,500,000. CD 12/30.

▲ **N. J., Dover**—SHOPPING CENTER—Milton L. Ehrlich, Inc., 300 Fourth Ave., New York 10, N. Y., plans by Rudolph Kruger & Robert H. Fava, 11 Hill St., Newark 2, N. J., shopping center with department store, and 31 retail units on 16-acre tract on Bassett Hy., $9,000,000.

▲ **Nev., Las Vegas**—BUSINESS CENTER—Ted M. Griss, c/o Paul R. Williams, archt., 3757 Wilshire Blvd., Los Angeles, Calif., 5 story business center known as "Nevada Square" $1,000,000.

▲ **N. J., Toms River**—HOSPITAL—Community Memorial Hospital Assn., Toms River, 75-bed hospital on 6-acre tract. $1,000,000.

N. Y., Astoria—CLUB—The Boys Club of Queens, Inc., 22-27 31 St., plans by Holden, McLaughlin & Assoc., 570 Lexington Ave., New York, Zone 17, 1 story, 159x192 ft. boys' club, 30 Rd. and 21 St. $450,000.

N. Y., Brooklyn—APARTMENT—Meyer Berfond, 3036 Ave. U, Zone 29, plans by Julius Fishkind, 161-19 Jamaica Ave., Jamaica, 6 story apartment, 47-71 Oliver St. $825,000.

N. Y., Brooklyn—APARTMENT—Gerry Constr. Corp., 2116 E. 34 St., Zone 10, plans by Martyn N. Weston, 44 Court St., Zone 2, 6 story apartment, 3018-30 Ocean Ave. $330,000.

N. Y., Brooklyn—APARTMENT—Howecrest Development Corp., 4126 Kings Hy., Zone 10, plans by Morris Rothstein & Son, 186 Joralemon St., Zone 2, 6 story apartment, 8721 Bay Parkway. $600,000.

▲ **N. Y., Brooklyn**—APARTMENT—Wesler & Roche, 32 Court St., Zone 2, plans by Morris Rothstein & Son, 186 Joralemon St., Zone 2, 6 story apartment, 2515 E. 29 St. $1,200,000.

N. Y., Jackson Heights—APARTMENT—Herrick Manor Inc., c/o Julius Fishkind, archt., 161-19 Jamaica Ave., Jamaica, 6 story apartment, 86 St. north of Roosevelt Ave. $546,000.

N. Y., Jamaica—APARTMENT—Winland Realty Corp., c/o H. H. Lilien, archt., 201 W. 72 St., New York, Zone 23, 6 story apartment, 84 Rd. east of Smedley St. $300,000.

▲ **N. Y., New York**—HOSPITAL—Hospital for Joint Diseases, 1919 Madison Ave., Zone 35, plans by Charles B. Meyers Assoc., 31 Union Square, Zone 3, hospital alterations, 41-43 E. 123 St., $500,000; hospital clinic alterations, 45-61 E. 123 St., $600,000.

N. Y., New York—SCHOOL—Mount Carmel Church, 627 E. 187 St., Zone 58, plans by Anthony J. DePace, 151 W. 46 St., Zone 19, 3 story school, 189 St. and Bathgate Ave. $900,000.

▲ **N. Y., New York**—PSYCHIATRIC TREATMENT—St. Vincent's Hospital, Seventh Ave. and 11 St., Zone 6, plans by Eggers & Higgins, 100 E. 42 St., Zone 17, 7 story psychiatric treatment bldg., 134-146 W. 12 St. $2,500,000.

N. Y., Yonkers—APARTMENT—Samuel Eidelberg, c/o Seelig & Finkestein, archts., 153 Pierrepont St., Brooklyn, Zone 2, 6 story apartment, 309 N. Broadway, $630,000.

N. Y., Yonkers—APARTMENT—Tibwick Realty Corp., c/o Lawrence A. Rothman, archt., 147 E. 125 St., New York, Zone 35, 6 story apartment, McLean Ave. and Tibbetts Rd. $412,000.

▲ **O., Cincinnati**—HOSPITAL—Sisters of Mercy, Rowan Hill Dr., Marlemont, plans by Maguolo & Quick, engr.-

Why the Finest New Buildings Have Q-Floor

Beyond the fact that Q-Floor offers the greatest electrical availability of any structural floor in existence (as indicated in the above illustration), there are several other vital reasons why it has become a part of the finest new buildings in America.

Q-Floor saves construction time and money. The steel cellular units come on the job cut to fit so that two men can lay 50 square feet in one minute. In the case of the U. S. Steel-Mellon Bank Building in Pittsburgh, forty floors were installed in four months. Because Q-Floor provides a perfect platform for work and storage, 1,000 men were able to operate on the job without interfering with each other. Q-Floor saves steel as a result of its favorable ratio of weight to strength. Footings and structural steel can be lighter than with ordinary construction. Moreover, Q-Floor saves drafting room time since completely predetermined wiring and mechanical layouts are not necessary. Because no combustible forms and shoring are required, there has never been a construction fire on a Q-Floor job. Add these features to low cost on wiring changes in the years to come, and it's easy to see why Q-Floors are a feature of America's finest new buildings.

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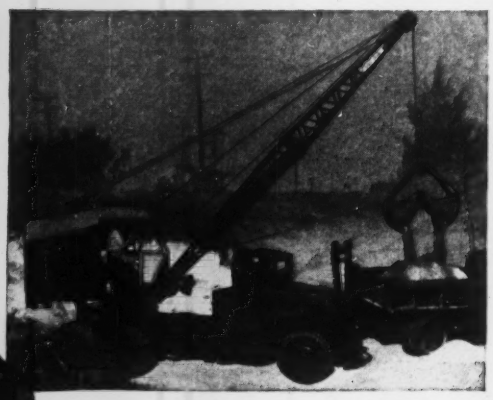
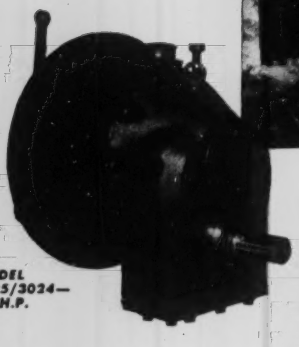
S-N REDUCTION GEARS





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ON HIGHLY MOBILE DIXIE CRANES

Designed for high speed operations that require a mobile unit, these three-eighths yard bucket Dixie Cranes — made by the Freshwater-Smith Machine Company, Ft. Pierce, Florida — are equipped with S-N Heavy Duty Herringbone Reduction Gears as original equipment in order to insure **maximum versatility** and the **smooth transmission** of full power from engine to load — smoothly — and at a minimum cost.

These rugged, compact S-N Reduction Gears are built for grueling, continuous operations with all types of engines from 40 H. P. units to 775 H. P. giants! They can be installed as original equipment or for repowering of pumps, shovels, generators, compressors and all types of dredging and ditching equipment. Available in a broad range of reduction ratios — of 1.5:1 up to 4:1. Our engineers will be glad to specify the best unit for maximum performance on your equipment. Write today for detailed catalog sheets. Address Industrial Division.

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Saxe Welding Connection Units position and secure structural parts to be welded

Clip K3A permits an adjustable connection.

These widely used units eliminate all hole punching and, with welding, produce the most economical, safe and quickly erected structural frame.

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archt., Temple Bar Bldg., 350-bed hospital on 34 acre site, Copper and Reading Rds. **$8,000,000.**

▲ **O., Warren**—HOUSING—Austin Village, Inc., c/o Don Farranicci, 218 High St., 800 to 1,000 homes on 245 acre tract along Leavittsburg Rd. **$6,000,000.**

▲ **O., Warren**—SHOPPING CENTER—Austin Village, Inc., c/o Don Farranicci, 218 High St., shopping center, incl. 4 story medical bldg. and 31 stores, along Leavittsburg Rd. **$4,000,000.**

▲ **Pa., Pittsburgh**—EDUCATIONAL—Rodef Shalom Congregation, Morwood and Fifth Sts., plans by Alexander Sharove, 601 Berger Bldg., brick, block educational bldg. addn., alterations, **$1,000,000.**

▲ **Pa., Phila.**—DORMITORY—University of Pennsylvania, 34 and Woodland Ave., men's dormitory for 413 students on campus. **$1,557,000.**

Tenn., Madison—SHOPPING CENTER—E. Lyman McLallen Jr., Alamo Plaza, Nashville, plans by Marr & Holman, Stahlman Bldg., Nashville, shopping center, **$500,000.**

Tex., Athens—OFFICE and AUDITORIUM—First Baptist Church Congregation, Horace Rogers, chn. Bldg. Comm., Athens, plans by Shirley Simons & Son, 1723 S. Broadway, Tyler, office, auditorium, altering, remodeling existing bldg. into 3 story educational. **$300,000.**

▲ **Tex., Corpus Christi**—OFFICE—Jaffe & Martin, 202 Winewood St., San Antonio, Tex., and O. S. Wyatt Jr., Wymore Oil Co., 433 William Dr., plans by Valdez & Williams, 918 Manor Dr., San Antonio, 10 story, bsmnt., 60,000 sq. ft., steel petroleum office known as Corpus Christi Petroleum Bldg., upper Broadway, adjacent to Wilson Tower Garage, **$1,000,000**, Beretta, Greenslade, Clark & Collins, Inc., 902 Travis Bldg., San Antonio, consult. engr.

Tex., Corpus Christi—SCHOOL—Sister of Incarnate Word & Blessed Sacrament c/o Mother Patricia 503 Last St., plans by Wade-Bigson & Martin, Med. Prof. Bldg., 2 story, 68,000 sq. ft., steel, brick exterior Senior High School, **$600,000.** H. P. McElhaney, Wilson Tower Corpus Christi, and T. A. Vernor, 304 Green Ave., Taft, consult. engrs.

Tex., Fort Worth—SCHOOL, etc.—Thomas Gorman, Bishop of Catholic Diocese, Dallas, plans by Boese & Harkrider, 1003 T & P Bldg., St. Andrews Parish School and Rectory, Stadium Dr. and Dryden Lane. **$310,000.**

Tex., Houston—DWELLINGS—Jas. H. Edmonds, 8702 Humble Rd., addnl. 30 dwellings in area of Couch Park Subdivision, **$320,000.**

Tex., Houston—DWELLINGS—R. V. King & Assoc., c/o King Realty Co., Bankers Mortgage Bldg., plans by Matt Howard, Jr. & Assocs., 1012 LeHall St., 35 dwellings, **$350,000;** 37 dwellings, **$325,000.** CD 8/13.

▲ **Tex., Houston**—LIBRARY, etc.—St. Thomas University, 2812 Montrose Blvd., plans by Maurice J. & Chas. F. Sullivan, 3901 Travis St., library, **$350,000,** Francis J. Niven, 3908 Main St. and Howard & Johnson, 4926 Travis St., consult. engrs.; science and classrooms wings, **$300,000;** masonry type chapel, **$400,000;** masonry type student's union **$500,000.**

Tex., San Antonio—DWELLINGS—Las Palmos Building Co., 1231 N.W. 36 St., 38 dwellings, Lillita and other streets. **$320,000.**

▲ **Tex., San Antonio**—DWELLINGS—H. B. Zachry Properties, Inc., Transit Tower Bldg., San Antonio, Tract No. 1 30 masonry dwellings, **$350,000;** Tract No. 2, 24 asb. siding dwellings, **$300,000;** Tract No. 3, 20 brick, dwellings, **$315,000;** Tract No. 4, 33 masonry dwellings, **$375,000,** adjacent Northridge Park off Military Hy.

Tex., Waco—HIGH SCHOOL—St. Mary's Catholic Church, 1401 Washington Ave., plans by Walter Cocke, Jr. & Co., 1507 Franklin St., Junior and Senior High School. **$500,000.** Frank T. Drought, 117 W. Pecan St., San Antonio, consult. engr. CD 5/20.

Wis., Watertown—DORMITORY, etc.—Northwestern College, 525 College Ave., plans by E. A. Stubenrauch & Assocs., 712 Erie Ave., Sheboygan, dormitory, recitation bldg., refectory. **$950,000.**

▲ **Alta., Lethbridge**—STORE—T. Eaton Co. Ltd., 190 Yonge St., Toronto, Ont., 2 story, 125x158 ft. department store addn. and extensive remodeling of present store. **$2,000,000.**

▲ **Ont., Bronte**—HOUSING DEVELOPMENT—Bronte Development Co., c/o R. H. Gale, Bronte, housing development, incl. 353 homes on 87-acre site, water system, etc. **$3,500,000.**

▲ **Ont., Lindsay**—HOSPITAL—Ross Memorial Hospital, Lindsay, hospital addn., $1,000,000 or separate hospital bldg., $2,000,000.

Ont., Toronto—SHOPPING CENTER—S. Arnold, Unionville, plans by Meschino & Assocs., 660 Eglinton Ave. E., Stellite Community Shopping Centre, Markham, **$350,000.**

▲ **Que., Three Rivers**—COLLEGE—Rev. Franciscans Fathers, 1274 Laviolette St., plans by David Deshaies 737 Buchanan St., St. Laurent, college. **$1,000,000.** CD 7/10.

▲ **Ont., Toronto**—HEADQUARTERS—Salvation Army, 538 Jarvis St., plans by John B. Parkin Assoc., 717 Church St., 10-story, headquarters at Albert and James Sts. **$1,500,000.**

▲ **Que., Westmount**—APARTMENTS, etc.—Syndicate, c/o Bernard Wolfe, 3544 Alwater Ave., Montreal, plans by Greenspoon, Freedlander & Dunne, 4151 Sherbrooke St. W., Montreal, apartments, commercial bldgs., stores and offices, St. Catherine St. W. **$3,000,000.**

(Continued on page 141)

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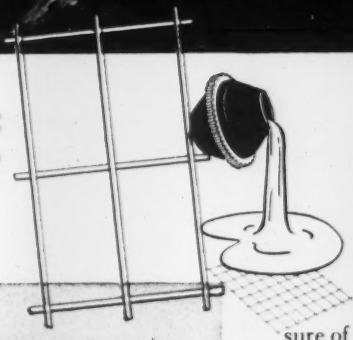
order your Wire Fabric now!



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1 MICHIGAN AIR CONTROL... *FAST, SMOOTH, POSITIVE*

The MICHIGAN Line is famous for fast, smooth swing—no jerk, no grab—with finger-tip operation. Operator stays at peak efficiency all day because air-power does the work. A minimum of dead-weight inertia; and no static friction—6 hook rollers with anti-friction bearings assure smooth, effortless swing.

2 CIRCLE GEAR AND CENTER POST CAST INTEGRAL...

Take a good look at this—then compare it to the gear on any other machine built. See it in operation. Its internal tooth drive is inherently rugged and dependable. Hook-roller paths are cast integral and machined to a taper that matches the taper of the six rollers.

3 TURNTABLE DECK AND SIDE FRAMES CAST IN ONE PIECE...

Turntable shafts, ball-bearing mounted in the side frames, *can't get out of line*—eliminating a major cause of wear and replacements. That's why the turntable gives years of uninterrupted service. Hook roller mounting brackets also are cast integral with the machinery deck.

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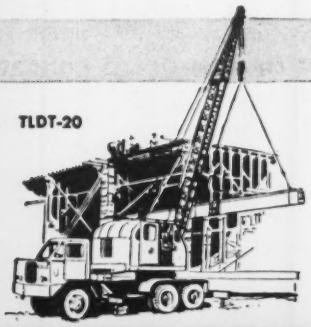
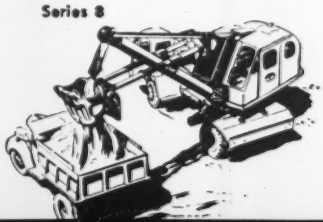
TMDT-16


TLDT-20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with a MICHIGAN

"Nearly 500 yards of tough clay in 7 hours!... that's real earth moving!" says Jim Smith, operator

JOB	County Road Ditch—80 rods, 8' x 6' x 3' bottom
MACHINE	TMDT 16—Diesel powered
OWNER	Van Buren County (Mich.), Road Commissioner
YARDS HANDLED	About 500 per day
MATERIAL	Clay
FUEL	8-10 gallons per day
COMMENT	"This is way ahead of former machines. Remote control is swell. Air control makes fast, easy operation. You can see what you're doing. Fine balance, too . . . " Jim Smith, operator for Van Buren County.

Moves More Yardage faster, at low cost, dependably

4 MICHIGAN MS CLUTCH...

An exclusive advantage, entirely new—this single-disc double-faced clutch with six interchangeable segments on each face. Worn segments are easily replaceable *in the field*, in a matter of minutes—an extraordinary time-saver. A cool-running clutch, effectively ventilated, always efficient—no adjustments for temperature.

5 EXTREME EASE OF *MAINTENANCE and SERVICE*

Greasing time is negligible—a few minutes per day. Reasons:

- Anti-friction bearings instead of bushings
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For decisive proof that you get More for Your Money in a MICHIGAN, *see* the MICHIGAN Line in action—and check each machine, point by point, with other machines of equal capacity. See your MICHIGAN dealer—and write for literature.

C-16

Construction Machinery Division

CLARK EQUIPMENT COMPANY

500 Second Street, Benton Harbor, Michigan, U. S. A.

THE ENGINEER'S REPORT

DATA

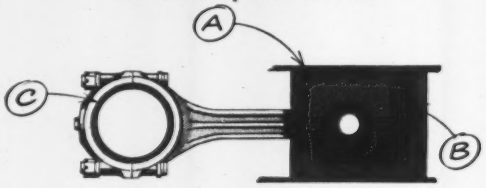
LUBRICANT	RPM Delo Oils
UNITS	Allis-Chalmers HD 20's & 19's
OPERATION	Clearing timber land for reservoir
CONDITIONS	Heavy pulling and bulldozing
FIRM	Paul C. Helmick Co., Seattle, Wash.

No stuck rings in 14 months of unusually tough work!

CLEARING 4000 ACRES OF TIMBER LAND in 14 months is the tough job being completed by these big Allis-Chalmers diesels, owned by Paul C. Helmick Co., Seattle, on Bureau of Reclamation job at Cascade, Idaho. Yet, lubricated with RPM DELO Special Lubricating Oil, there was not a single stuck ring or bearing failure in the entire period! Timber was pulled down in 30 ft. swaths by a 130 ft. anchor chain hooked to two of the 275-h.p. HD 20's; logs were bucked into piles and burned.

ENGINE PARTS WERE KEPT CLEAN by the special ingredients of RPM DELO Oils. The representative piston, sleeve, wrist pin, and con-rod bearing shown in this unretouched photograph, indicate the minimum carbon deposits. Assembly was pulled for inspection when the A-C unit was in for check-up... and put back in service as is.

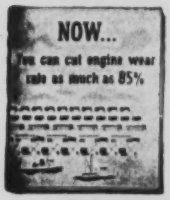
How RPM DELO Oils keep engines clean and prevent wear



A. Contain special additives that provide metal-adhesion qualities...keep oil on parts whether they are hot or cold, running or idle.

B. Anti-oxidant resists deterioration of oil and formation of lacquer...prevents ring-sticking. Detergent keeps parts clean, helps prevent scuffing.

C. Special compounds stop corrosion of bearing metal, and oil foaming in both wet and dry sump engines.



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(Continued from page 136)

INDUSTRIAL BUILDINGS

Fla., Hialeah—PLANT—Florida Frozen Food Processors, 3212 N. W. North River Dr., Miami, packing plant $100,000. Obole & Clarke, 605 Lincoln Rd., Miami Beach, consult. engrs.

Ga., Augusta—WAREHOUSE—General Electric Supply Corp., 172 Haynes St. S. W., Atlanta, Ga., warehouse, $200,000.

Ga., Savannah—PLANT—Mente & Co., Louisville Rd. plant addn. $100,000.

Ind., Huntington—FACTORY—Angier Products Co., 120 Potter St., Cambridge, Mass., factory west of here, along U. S. 24, $100,000.

Ia., Des Moines—PLANT—Solar Aircraft Co., 18 and Grand Sts., plant addn. $800,000.

La., Baton Rouge—PLANT—Esso Standard Oil Co., North Baton Rouge, plans by Bodman & Murrell, 1175 Nicholson Dr., pilot plant, $125,000. CD 10/9/51.

Me., Livermore Falls—FACTORY—Livermore Development Corp., Livermore Falls, plans by Alonzo J. Harriman, Inc., 292 Court St., Auburn, steel, rein.-con. shoe factory.

Miss., Aberdeen—PLANT—Aberdeen Development Co., Aberdeen, plant, $125,000.

Miss., Jackson—WAREHOUSE-OFFICE—National School Pictures, Inc., N. Monument St., plans by James T. Canizaro, Plaza Bldg., warehouse-office, $150,000.

N. J., Englewood—FACTORY—Crystal Transparent Corp., 136 W. 21 St., New York 11, N. Y., plans by Carl O. Kaiser, 237 Broad Ave., Leonia, factory, William St. and Forest Ave. $200,000.

N. Y., Jackson Heights—FACTORY and OFFICE—Lerkoff-Sennet Co., c/o Alfred Eccles, archt., 29-27 41 Ave., Long Island City, factory and office, 85 St. and 24 Ave. $390,000.

N. Y., Whitestone—WAREHOUSE—Bernard Aginsky, c/o D. H. Rosenberg, archt., 118 Liberty St., New York 6, 1 story warehouse, 61 St. south of 37 Ave., $150,000.

N. C., Clinton—PLANT—Cumberland Dairy Products, Clinton, plans by Voorhees & Everhart, 658½ N. Main St., High Point, dairy plant, $100,000.

O., Bellefontaine—PLANT—Bulldog Electric Products Co. of Ohio, Bellefontaine, 1 story, 48,000 sq. ft. plant addn. $350,000.

▲ **O., Cincinnati**—ASPHALT REFINERY—American Bitumuls & Asphalt Co., 200 Bush St., San Francisco, Calif., asphalt refinery on 100 acre tract along Ohio River at Miami Fort, 12 mi. west of here, $4,000,000.

Okla., Mangum—PLANT—Armco Steel Co., Commerce Bldg., Houston, Tex., sheet metal frabricating plant, $125,000, T. M. Neibling, c/o owner, engr.

R. I., Cranston—MACHINE SHOP, etc.—Alrose Chemical Co., 180 Mill St., plans by Dimitri & Dimitri 17 Exchange St., Providence, machine shop, Mill St., $85,000; 2 story, 74x143 ft. warehouse, $100,000.

Tenn., Memphis—WAREHOUSE—B. F. Goodrich Co., 500 S. Main St., Akron, O., warehouse addn. $120,000.

Tenn., Nashville—WAREHOUSE—Sears, Roebuck & Co., 675 Ponce De Leon Ave., Atlanta, Ga., warehouse, $300,000.

Tex., Dallas—LIVESTOCK PENS—Neuhoff Brothers, Packers, 2821 Almao St., 35,000 sq. ft., rein.-con. livestock pens. $100,000.

Tex., Houston—WAREHOUSING OR STORAGE—Crown Central Petroleum Corp., Union National Bank Bldg., 70,000 sq. ft., masonry rein.-con. warehousing or storage, concrete pier and beam fdn.,. partial air-conditioning, near here. $564,383.

Tex., Houston—WAREHOUSE—Reader's Wholesale Distributors Inc., 414 Washington Ave, plans by Irving R. Klein & Assocs., 1317 Austin St., 100,000 sq. ft., metal concrete, masonry warehouse, east of north Main St. near Naylor St. $550,000.

Tex., Killeen—STORAGE—Texas Fireproof Storage Co., Killeen, 35,000 sq. ft., concrete storage expansion, $285,000.

Alaska, Palmer—POWER PLANT—Matanuska Valley Co-operative, Palmer, rebuilding power plant, $100,000.

Ont., Tilbury—FACTORY—E. J. Marchand, Tilbury, 1 story, 90x150 ft., brick, steel, cement blocks factory. $125,000.

▲ **Ont., Toronto**—WAREHOUSE—Drummond McCall & Co. Ltd., 373 Front St., E., steel distributing warehouse on 17-acre site near former Barker airport in northwestern Toronto suburban area, $1,500,000. Margison & Babcock, 119 Isabella St., consult. engrs.

UNCLASSIFIED

California—GAS PIPE LINE—Southern Counties Gas Co., 810S. Flower St., Los Angeles, 14 mi. steel gas pipe line from Brea to Santa Ana, Orange Co. $879,962.

Ga., Atlanta—SWIMMING POOL—City, City Hall, swimming pool at John A. White Park, $110,000.

▲ **Ga., Dalton**—GAS SYSTEM—City, City Hall, natural gas distr. sys. $2,250,000. J. W. Goodwin Eng. Co., 2111 7th Ave. S., Birmingham, Ala., consult. engr. CD 1/13.

Ga., Lafayette—GAS DISTRIBUTION SYSTEM—City, City Hall, natural gas distr. sys., $510,000. J. W.

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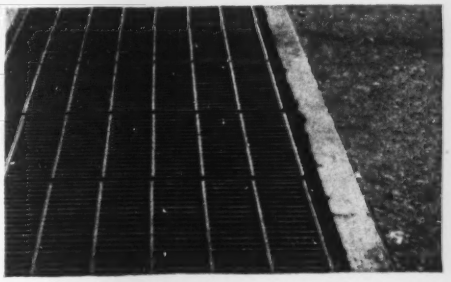

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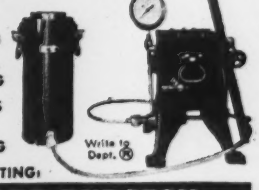

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Goodwin Eng. Co., 2111 7 Ave. S., Birmingham, Ala., consult. engr. CD 1/13.

Ga., Summerville—GAS DISTRIBUTION SYSTEM—City, natural gas distr. sys. **$850,000.** J. W. Goodwin Eng. Co., 2111 7 Ave. S., Birmingham, Ala., consult. engr. CD 1/13.

Ga., Trion—GAS DISTRIBUTION SYSTEM—City, natural gas distr. sys. **$200,000.** J. W. Goodwin Eng. Co., 2111 7 Ave. S., Birmingham, Ala., consult. engr. 1/14.

Kentucky—RURAL DISTRIBUTION LINES—Fox Creek Rural Electric Co-operative Corp., Lawrenceburg, 26 mi. rural distr. line and sys. imprvs., Anderson Co. **$125,000.**

New Mexico—GAS LINES—Southern Union Gas Co., Burt Bldg., Dallas, Tex., addnl. gas line extens. Clovis, **$200,000;** booster station, Clovis, **$200,000.**

N. Y., Brooklyn—RECEIVING VAULT, etc.—Greenwood Cemetery, Fifth Ave. and 25 St., plans by Eldredge Snyder, 101 Park Ave., New York, Zone 17, 1 story receiving vault, offices, etc., on premises, **$500,000.**

N. Y., New York—FREIGHT PLATFORM, etc.—New York Central System, J. P. Hiltz, Jr., ch. engr., 466 Lexington Ave., Zone 17, railroad freight platform and offices, 614-53 W. 36 St. **$200,000.**

O., Toledo—DOG POUND—Bd. Trustees, Toledo Humane Society, 418 Erie St., plans by Alfred A. Hahn, 723 Adams St., 90x110 ft., masonry dog pound, incl. caretaker's apartment on second floor, Wabash, 11 and Vance Sts., **$125,000.**

Okla., Lawton—FAIR GROUNDS—Comanche Co., **$225,000** bond election Sept. 22, imprvs. at Fair Grounds, Wyatt Hedrick, Lawton, consult. engr.

Oregon—RURAL DISTRIBUTION LINES—West Oregon Electric Co-operative, Vernonia, Ore., 30 mi. rural distr. line and sys. imprvs., Columbia Co. **$185,000.**

Texas—RADIO TOWERS—Texas & Pacific Ry. Co., R. J. Gammie, ch. engr., 1025 Elm St., Dallas, 11 steel radio towers of 103 ft. height along T. & P. 202 mi. of right of way between Dallas and Texarkana, vicinity of Mesquite, Terrell, Wills Point, Grand Saline, Mineola, Big Sandy, Longview, Marshall, Jefferson, Atlanta and Texarkana, **$375,000.**

Tex., Arlington—GOLF COURSE, etc.—City, 18-hole golf course, 160-acre tract, northeast area, **$90,000;** new municipal park and playgrounds, incl. baseball diamonds, tennis courts, etc., on Randell Mill Rd. in northwest Arlington grounds, **$75,000,** Robert Caldwell, 6638 N. Main St., Houston, consult. engr. on above projects; Meadowbrook Park in southeast, **$70,000;** developing 5 neighborhood municipal parks, **$100,000.**

Tex., Beaumont—FIELD HOUSE—Lamar State College of Technology, 4400 Pt. Arthur Rd., plans by Stone & Pitts, 1872 Calder Ave., fieldhouse, incl. 3 basketball courts, etc. **$750,000.**

Tex., Brownsville—STADIUM—Brownsville Independent School Dist., Brownsville, voted $100,000 bonds Aug. 21, stadium, **$516,000.** CD 8/5.

Tex., Freeport—TRANSIT SHED—Brazos River Harbor Navigation Dist., Freeport, 1 story, 80,000 sq. ft. steel, transit shed. **$400,000.** Cyril S. Adams, Inc., 6427 Jefferson Dr., Houston, consult. engr. CD 12/28/50.

Tex., Galveston—SWIMMING POOL—City, City Hall, rein.-con. outdoor swimming pool for whites, **$90,000;** rein.con. outdoor swimming pool for colored, **$75,000.**

▲ **Tex., Houston**—STREET LIGHTING—City, City Hall, 900 Brazos St., installing 1067 new ornamental mercury vapor lighting standards in downtown areas, **$1,875,000;** installing 461 new ornamental mercury vapor lighting standards for 9 major traffic arteries which will be made into great whiteways, **$950,000.** Frank Baldwin Pub. Wks. Dir. of Engineering.

▲ **Wash., Seattle**—GRAIN ELEVATORS—Port of Seattle, Bell St. Terminal, Zone 1, px modernize grain elevators, **$1,500,000.** G. T. Treadwell, ch. engr. CD 11/10/48.

Wyoming—OIL PIPE LINE—Powder River Pipe Line Co., Cheyenne, crude oil pipe line. **$544,000.** CD 1/22/48.

How to sharpen your bidding—

The October 8 issue of EN-R will be crammed with accurate data on costs of materials, machinery, and labor all over the country. Cost indexes, depreciation schedules, wage rates, and other data valuable to bidders are now being compiled and analyzed. Be sure you get your copy of Engineering News-Record's annual

CONSTRUCTION COSTS YEARBOOK

October 8, 1953

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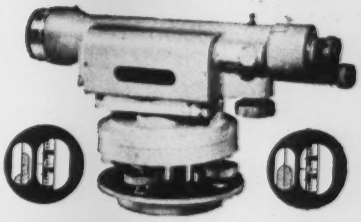

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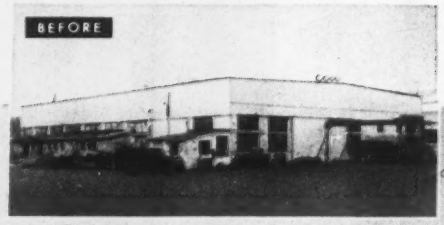
Handsome, permanent, insulated curtain walls built at low cost with Cemesto® Panels

The Gibbs Corporation, Jacksonville, Florida, modernizes its machine shop with Cemesto Panels. Permanent, weather-tight, maintenance-free walls of Cemesto Panels replace old, worn wood siding—give a new look, a new lease on life to the building.



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Whether the job is replacing old, worn walls on an existing structure, or selecting a curtain wall material for a new building—Cemesto Insulating Structural Panels permit important economies in design, erection and maintenance. They simplify and speed the job—build strong, fire-resistant, insulated curtain walls with remarkable savings in time, labor, materials!

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Each Cemesto Panel is a *complete, self-contained* curtain wall unit combining high insulation value—great structural strength—pleasing interior and exterior finish. No maintenance needed. Used with attractive new aluminum joint treatment, Cemesto Panels give you curtain walls that are unusually trim and good looking.

Cemesto Panels are quickly attached to steel framing with metal clips, or to wood framing or wood members with nails or screws. Standard sizes readily adaptable to cost-cutting modular techniques. Can also be pre-cut to job specifications at the mill for even greater savings in construction time and cost.

Amazingly Versatile

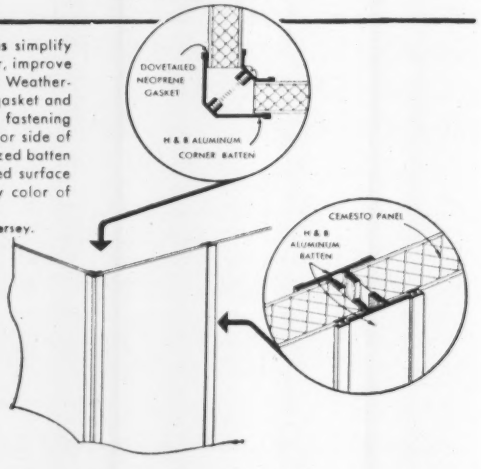
Cemesto Panels consist of a core of Celotex cane fibre insulation, with *non-combustible* cement-asbestos facings bonded to both sides by a vapor-resistant, moistureproof adhesive. They resist fire, weather and wear. Their insulating core is protected by the patented Ferox® process from dry rot and termites.

The smooth, hard, stone-gray surfaces of Cemesto Panels have a light reflection value of 58%. Left unpainted they are permanently maintenance-free. Combine harmoniously with brick, stone, wood and glass, or can be used as the sole curtain wall material.

WRITE TODAY for full data on how you can erect curtain walls, roof decks and partitions—faster and at lower cost—with Cemesto Insulating Structural Panels. The Celotex Corp., Dept. EN-93 120 S. LaSalle St., Chicago 3, Ill.

New Aluminum Curtain Wall Accessories simplify application of Cemesto Panels, save labor, improve appearance. Trim, new H & B* Aluminum Weather-stripping Battens have built-in neoprene gasket and continuous thread channels for engaging fastening bolts. Since bolts are applied from interior side of curtain wall, the exterior face of the anodized batten presents a smooth, unbroken, satin-finished surface which blends harmoniously with the gray color of Cemesto Panels.

*H & B Enterprise Corporation, Trenton, New Jersey.



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INSULATING STRUCTURAL PANELS

The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

MATERIALS AND LABOR PRICES

Market quotations on construction materials and wage rates reported monthly by ENR correspondents
October Materials, and Labor Prices will appear in October 8, 1953 issue

CEMENT, AGGREGATE, READY-MIXED CONCRETE—F. O. B. CITY

	PORTLAND CEMENT* Per bbl. C/L lots cash, dis. not deducted			SAND AND GRAVEL Per ton, carload lots			CRUSHED STONE Per ton, carload lots		CRUSHED SLAG Per ton, carload lots, f.o.b. plant		CONCRETE BLOCK 8 x 8 x 16-in.: truckload del.: per block		CONCRETE Ready Mixed 1:2:4, over. 50 c.y., del.
	Paper	Bulk	Mortar	Gravel, 1½ in.	Gravel, ¾ in.	Sand	1½ in.	¾ in.	1½ in.	¾ in.	Sand	grav. Lt. wgt. agg.	
Atlanta	$3.87	$3.56	3.40	$2.075	$2.075	$1.83	$2.20	$2.20	$1.87	$1.99	$0.21	$0.21	$12.06
Baltimore	3.90	3.60	3.53	2.50‡a	2.50‡a	2.00‡a	2.70‡a	2.80‡a	2.60‡a	2.55‡a	.17	.17a	11.45
Birmingham	3.26	2.60*	....	2.53n	2.53n	2.23n	2.64	2.64	1.25	1.45	.165	.165	10.45
Boston	4.16	3.84	3.96	2.50a	2.50a	2.50a	1.50a	1.60a	....	....	.215	.245a	12.00h
Chicago	3.48	3.17	....	3.25‡b	3.25‡b	3.65‡b	3.25‡b	3.25‡b	2.25‡	2.25‡	.23	.23b	11.70/11.94
Cincinnati	3.76	3.55	3.55	2.19‡c	2.24‡c	2.24‡c	2.54‡*	2.54‡*	....	....	.21	.225a	10.95
Cleveland	N. A. in C. L.	3.02*	....	2.05ef	1.85f	1.65	4.10a	4.10a	3.35‡	3.15‡	....	.24	14.40d
Dallas	3.15	2.85	2.90	2.18	2.28	1.84	2.22	2.38	....	....	.115e	.2675	9.40
Denver	4.04	3.74	4.04	1.80	2.00	1.20	....	....	....	....	.23	.255a	10.50
Detroit	3.77	3.50	3.57	4.25‡b	4.25‡b	3.75‡b	4.50‡	4.50‡	4.50‡	4.50‡	.21	.22a	12.00f
Kansas City	3.42	3.12	3.20	1.85‡	1.85‡	1.50‡a	2.00‡a	2.00‡a	....	....	.20ag	.215e	12.00b
Los Angeles	4.32a	3.80a	4.92	2.11a	2.31a	2.06a	2.06a	2.16a	....	....	.135/m	.237m	11.71h
Minneapolis	3.95d	3.64d	3.56	2.55‡ag	2.55‡ag	1.50‡ag	2.75‡ag	2.75‡ag	....	....	.23ih	....	12.25fi
Montreal	3.16ac	2.96ac	....	3.00	3.00	2.25	1.40ij	1.40ij	....	....	.20	.20a	11.10k
New Orleans	3.35	3.02	3.18	2.32	2.32	1.82	....	....	1.05	1.25	.25	....	12.90
New York	4.01	3.70	3.53	2.75bk	2.75bk	1.80bk	2.70bl	2.70bl	....	....	....	....	13.55an
Philadelphia	3.58/3.97‡	3.27/3.64‡	3.58/3.63‡	2.75‡v	2.75‡v	2.15‡v	2.30‡	2.40‡	2.00	1.90	.22/.26	....	12.50o
Pittsburgh	3.47	3.19	3.47	2.25‡	2.25‡	2.20‡	2.60‡	2.60‡	2.15	2.15	.22d	.22d	13.00
St. Louis	3.42/3.63b	2.99/3.25b	3.25/3.42	3.10am	2.90am	2.50/2.90am	1.70j	1.70j	1.50	1.50	22	.28es	11.40
San Francisco	3.56	3.16	....	1.92	1.92	2.02	2.02	2.02	....	....	....	.27el	11.25e
Seattle	4.65a	3.35a	5.80h	3.00‡bm	3.00‡bm	3.00‡bm	3.50‡bm	3.50‡bm	....	....	.25j	.3325j	11.90f

‡Delivered. * Prices incl. dealers discount except as noted.
CEMENT: a Subj. to 10¢ dis. b Less 2% for cash. c CL price dealers discount not incl. d Dealers sell only LCL. e Truckload lots, destination price. h LCL.
SAND, GRAVEL, STONE & SLAG: a Truck lots. b Per cu. yd. c 5 tons or more. e ¼". f Pea gravel. g Less 5% for cash. h Less than 5 tons. i Sales tax incl. j F.o.b. quarry. k Barge lots asd. l F.o.b. scow Hudson river. m Less 2% for cash. n F.o.b. cars. o 1-3 mi zone. p Add 10¢ for ea. add'l 3-mi zone
CONCRETE BLOCK: a Cinder. b Waylite. c Haydite. d Celocrete. e 5½ x 8 x 12 in. f 8 x 4 x 16. g F.o.b. truck at job. i Less 2% for cash. j Less 1% for cash. k 8x8x18. l F.o.b. plant San Rafael. m F.o.b. yard.
READY MIXED CONCRETE: a 5 cu. yds. or over del. Man. b 25 cu. yds. or more. c 10–100 cu. brackets. d 1–3 mi. zone. e 2,000 lb concr. f 2500 lb. comp. h Less 50¢ for cash. i 5% off for cash. j 2% off for cash. k Sales tax included. l 1:2½:4. m F.o.b. yard. n Plus escalator clause. o Add 15¢ for ea. add'l 3-mi zone

CASH DISCOUNTS CEMENT to Contractors: Truck delivery, 2% for cash on 10th of month; on carload deliveries, no trucking, same as dealer cash discount 10c. per bbl. for payment within 15 days of date of invoice. Subject discount 10c. per bbl. 20 days in Montreal.

CURRENT MAXIMUM PRICES AT CEMENT MILLS

Charge for bags not included. For paper bags add 30¢ per bbl., not refundable

	Bulk		Bulk		Bulk		Bulk		Bulk
Richard City, Tenn	$2.75†	Buffington, Ind.	$2.70†	Steelton, Minn	$2.80†	Muskegon, Mich	$2.85†	Toledo, O	$2.75†
Clinchfield, Ga	2.75†	Independence, Kan	2.65†	Leeds, Ala	2.60†	Saginaw, Mich	2.75†	Milwaukee, Wis	2.90†
Kingsport, Tenn	2.75†	Hannibal, Mo	2.70†	Duluth, Minn	2.80†	Wyandotte, Mich	2.75†	Green Bay, Wis	2.90†
West Des Moines, Iowa	2.80†	Northampton, Pa	2.75†	Hudson, N. Y.	2.75†	Buffalo, N. Y.	2.75†	Ironton, O	2.75†
Nazareth, Pa	2.75†	Universal, Pa	2.80†	Alpena, Mich	2.65†	Oswego, N. Y.	2.90†	Montreal City	2.66
Bath, Pa	2.75†	Waco, Tex. (+ 10¢ tax)	2.60†	Detroit, Mich	2.75†	Cleveland, O	2.75†	W. Winfield, Pa	2.80†

† *Prices to hold for third quarter of* 1953.

PAVING BRICK, BLOCK, ASPHALT, ROAD OILS—F. O. B. CITY

	PAVING BRICK AND BLOCK			PAVING ASPHALT Per ton, less than 80 penetration		ASPHALT BINDERS—FLUXES Per gal., 80–300 penetration		CUTBACK ASPHALT Per ton		ROAD OIL Per gal.	ASPHALT EMULSION (Quick-breaking) Per gal.	
	Granite Per M lots of 50,000 4x4x8 in.	Brick per M 3x4x8½ in. carload lots	Wood per sq. yd. 3½ in. 16-lb. treat	Tank car	Drums	Tank car	Drums	Tank car	Drums	Tank car	Tank car	Drums
Atlanta	$82.00	$41.00	$2.25	$26.00	$33.25	$0.215	$0.455	$0.095w	$0.185w	$0.105	$0.115	$0.225
Baltimore	150.00‡	75.00‡	....	22.00i	.....	.0809i	0.15i	.09iw	.17iw	.09i	.09i	0.12i
Birmingham	.....	45.50i	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Boston	.....	.....	.....	24.50a	35.50a	22.00av	35.50av	.....	.....	.09a	.105a	.22a
Chicago	155.00‡	90.00‡b	3.60/3.65‡j	21.05b	31.05b	20.05bv	30.05bv	.0925bw	.1825bw	.0775b	.....	.....
Cincinnati	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Cleveland	200.00	65.00d	5.03g	23.00k	.....	23.00k	.....	.1025kw	.....	.....	.11k	.18k
Dallas	e	40.00	e	24.05	43.09	.1016	.2103	27.09	47.87	.0980	.1041	.2128
Denver	.....	50.00	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Detroit	.....	92.00	.. ..	27.21	....	27.21v	.....	.1202w	.....	.0925	.....	.2811r
Kansas City	e	e	e	16.20el	...	.06	....	.07nw	.....	.06e	0.10	.....
Los Angeles	e	.....	e	16.00dmz	...	16.00dvz	...	18.00dz	.....	17.00dv	.0825f	.1725f
Minneapolis	.....	.....	2.97h	22.00	....	24.07	.....	.0744w	.....	.08	.10	.....
Montreal	.....	e	e	27.10n	36.65n	.135n	.193n	16.30nu	18.80nu	.132n	.184ns	.225ns
New Orleans	.....	.....	.....	17.50v	v	17.50vv	v	.085nw	v	.0825p	.085	. ...
New York	.....	.....	3.12f	26.26q	47.59q	25.26st	46.58st	.1071w	.2021w	.1071	.1072	.1993
Philadelphia	175.00	110.00	4.06	22.00	....	....	.....	.095u	.....	.....	...	.....
Pittsburgh	165.00	48.00	4.60	27.00	37.00	.10	21	27.00	40.00	.095	.10	.22
St. Louis	.....	.....	.....	18.66f	....	.1758	....	.084 / .0865w	....	0.155	.10	....
San Francisco	.....	55.00*	.....	17.50g	33.00gp	17.50gkv	23.00gkv	20.00g	37.50g	18.75v	.085y	.....
Seattle	.....	.....	.....	17.50h	38.00h	17.25hv	.....	20.00h	..	19.75hv	.095h	.105hr

‡ Delivered.
PAVING BRICK & BLOCK: a CL. b 3½ x 4 x 8½. c 2½ x 8½ x 4. d LCL truck deliveries. e Not used. f 2" interior 6# treat. g 3". h 8# treat. i 3 x 3⅝ x 8½. j 2½", 6 tr.
ASPHALTS: a Price at plant, Everett, Mass. b F.o.b. refinery, Lockport, Ill. c F.o.b. Sugar Creek, Mo. d F.o.b. refinery, El Segunda. e F.o.b. Baton Rouge. f F.o.b. Wood River or Roxana, Ill. g F.o.b. Richmond, Calif. h F.o.b. Martinez. i F.o.b. refinery, Baltimore. j F.o.b. refinery; Inglewood, Calif. k 50–110 penetr. l Less than 100 penetr. m 40–80 penetr. n Tax incl. o Drums not avail. p Shipped in steel bbl. q 40–85 penetr. r In customer's drums. s Shipped in drums, per drum. t 85–300 penetr. u Per 100 gal. v Per ton. w Per gal. x Also tank trucks. y F.o.b. Oakland. z F.o.b. refinery, Cleveland. # F.o.b. Norco, La.

IRON AND STEEL PRODUCTS—PER 100 LBS. BASE MILL PRICES

	STRUCT SHAPES—	PLATE CARBON STEEL	REINF BARS billet	RIVETS ½-in. structural	SHEET PILING	STEEL RAILS— Per Net Ton			TRACK SUPPLIES—			
						Standard	Light	Re-rolled	Angle Bars	Std Spikes	Tie Plates	Track Bolts
Birmingham Area	$4.10	$4.10	$4.15	$8.90	....	$86.50	$104.00	Not	$5.275	$7.05	$5.125	....
Chicago Area	4.10	4.10	4.15	8.90	$4.925	86.50	104.00	avail-	5.275	7.05	5.125	....
Pittsburgh Area	4.10	4.10	4.15	8.90	4.925	86.50	104.00	able	5.275	7.05	5.125	$11.00
Buffalo Area	4.10	4.10	4.15	8.90	4.925	86.50	104.00	....	5.275	7.05	5.125	11.00
Cleveland	....	....	4.15	8.90	4.925	.....	.....	....	....	....	.....	11.00
Youngstown Area	....	....	4.15	.....	.....	.....	.....	....	....	7.05	....	....
Geneva	4.10	4.10	....	....	....	.....	.....	....	....	....	....	....
Los Angeles	....	....	....	....	4.925	.....	.....	....	....	7.05	....	....
Pueblo	4.30	4.70	4.75	....	....	.....	95.00	....	5.275	7.05	5.125	11.00

IRON AND STEEL PRODUCTS—F. O. B. WAREHOUSE, PER 100 LBS., BASE PRICE

	STRUCTURAL SHAPES Per 100 lb. base price	REINFORCING BARS Per 100 lb., base price u 5 tons to carload lot b New billet	Rail steel	Add for switch	$/cwt for Del.	EXPANDED METAL LATH k Per 100 sq. yd., carload lots Std. diamond mesh. 3.4 lb.	Std. ribbed 3.4 lb.	WELDED FABRIC REINFORCING d Per 100 sq. ft., carload lots 4x16 in., No. 5 & 10 wires	4x12 in., No. 8 & 12 wires	6x6 in., No. 6 & 6 wires
Atlanta	$7.31	$7.11	$7.11	$.025	$...	$38.00‡	$42.00‡	A.P.M.* Joliet, Illinois, Donora, Penn., $3.08 F.o.b. Mill: Monessen, Penn., $3.08	A.P.M.* Joliet, Illinois, Donora, Penn. $2.02 F.o.b. Mill: Monessen, Penn., $2.02	A.P.M.* Joliet, Illinois, Donora, Penn., $3.23 F.o.b. Mill: Monessen Penn., $3.23
Baltimore	6.98	6.91f	....	....	....	42.00	45.00			
Birmingham	6.35	6.15	6.15	.05	.15	47.00p	52.00p			
Boston	7.06a	7.22	7.22	....	....	40.50	44.50			
Chicago	6.46	5.75ff	5.75ff	.0625	....	46.00C	51.00C			
Cincinnati	6.93ak	6.71r	....	....	.15	38.00azer	42.00azer			
Cleveland	6.79	5.61v	....	....	....	39.00‡	43.00‡			
Dallas	9.05	7.25	7.25	....	....	49.00	52.00			
Denver	7.55	7.30e	....	....	....	49.00s	60.50qs			
Detroit	6.93	7.04n	....	....	.30	53.00	58.00			
Kansas City	7.05nn	7.27	....	....	....	43.50	45.00			
Los Angeles	7.35fkk	6.85g	....	....	....	51.00	57.00			
Minneapolis	6.92kk	7.53ll	7.53ll	....	....	37.00	41.00			
Montreal	8.20kB/9.20k	6.05i	6.05g	....	....	53.50kk	58.50k			
New Orleans	....	5.98ok	....	.05	....	66.00	60.00			
New York	7.20	7.01	7.01	....	.30	38.50st	44.00st			
Philadelphia	6.42	6.67	....	....	....	38.00‡	42.00‡			
Pittsburgh	6.40	6.40	....	....	.10	37.60	39.60			
St. Louis	6.86a	6.30e	6.30e	....	....	50.00aa	55.00aa			
San Francisco	7.25	6.85l	....	....	....	40.50	43.50			
Seattle	4.85e	6.20el	....	....	....	57.00mm	47.00mm			

* At Producing Mill.

‡ Delivered. *b* Less than 700# add 50¢; 700–1499# add 65¢; 1500 to 7999# add 50¢. *c* 20 tons or over base. *d* Mill price plus freight. *e* F.o.b. plant. *f* Includes delivered in free delivery zone. *g* 10,000 to 39,999 lbs. *k* List price. Dominion tax exempt. Provincial and Municipal tax extra. *i* Plus Dominion, Provincial and Municipal sales tax. *j* Price per ton. *k* F.o.b. city. *l* Intermediate and hard grade, new billet. *m* Per sq. yd. *n* 5–10 tons. *o* 5 to 20 tons base. *p* Del. of 500 sq. yd. or more. *q* Std. ribbed, 4 lb. per sq. yd. *r* 5 tons or over. *s* LCL. *t* Asphalt coated. *u* Note: Revised size extra — 1 in., 1¼ in., 1½ in., 30¢. ⅞ in., ⅞ in., 45¢. ¾ in., ⅝ in., 55¢. ½ in., 80¢. ⅜ in., $1.10. ¼ in., $2.20. *v* 20 tons. Straight. *w* Copper bearing. *x* 2.5 lb. per sq. yd. *y* $0.0093 transportation tax included. *z* Copper alloy. *aa* Delivered truck to job. Contractor to do unloading. *dd* F.o.b. dock. *ee* F.o.b. cars. *ff* Carload lots. *gg* Including sales. *hh* 10,000–19,999 lbs. *ll* 5 to 8 tons, f.o.b. city. *mm* 2% off for cash. *nn* 1–5 tons. *pp* 10 tons to CL. *qq* 2000–9999 lbs. *A.* Amer. struct'l shapes. *B.* Canadian shapes. *C.* Deliv to contractor.

PLUMBING, HEATING, WATER, SEWER AND DRAIN PIPE

	C. I. PIPE Per net ton f.o.b. 6 in. to 24 in. *a*	ASBESTOS CEMENT PIPE per lin. ft., f.o.b. city 6" Pr Cl. 150	12" Sew Cl. I	VITRIFIED SEWER PIPE Per foot, Delivered ASTM C13–44T std. 8 in. s.s.	std. 12 in. s.s.	24 in. ds.	36 in. ds.	CLAY DRAIN TILE ASTM C4–24 Per 1,000 ft., carload lots, f.o.b. 6 in.	8 in.	CONCRETE SEWER PIPE Per ft., delivered: ASTMC 14–41 12 in.	24 in:
Atlanta	$101.00	$1.45	$2.42	$ .545	$1.27	$4.82	$12.925	$248.00	$356.00	$1.23	$2.62
Baltimore	121.50	1.45	2.42	.518	.990	4.095A	11.1725A	178.20	274.80	.95	2.60
Birmingham	103.00	1.45	2.42	.42	.75	2.99	....	250.00‡	375.00‡	1.25m	2.75m
Boston	113.00	1.47	2.20	.553uvz	1.0665uvy	4.41uvy	11.90uvy	187.80z	289.20z	1.62mg	3.95mg
Chicago	107.00	1.45	2.20	.70m	1.35m	5.62m	13.50m	150.00‡	270.00‡	.80	2.80
Cincinnati	106.00	1.47	2.29	.581y	1.120y	4.41y	11.375y	164.40	254.10	.80m	2.95m
Cleveland	108.00	1.47	2.29	.462z	.945z	3.69z	10.04z	158.00m	245.65m	.82m	3.10m
Dallas	112.00	1.47	2.54	.436	.822	3.234b	9.17b	.....	.....	.49	1.60
Denver	115.00	1.53	2.54	.45dd	.78dd	3.48dd	....	.....	.....	.74m	2.50m
Detroit	108.00	1.47	2.29	.75	1.45	5.75	15.50	240.00m	360.00m	.80	3.20
Kansas City	113.00	1.47	2.29	.53	.945	3.87	10.60	250.00	480.00	.70g	3.00g
Los Angeles	126.35	1.53	2.29	.62f	1.26f	5.21f	14.89f	228.20f	348.90f	.95	2.75ff
Minneapolis*	112.00	1.49	2.42	.72mo	1.32mo	5.32mo	....	.....	.....	1.38kk	3.93k
Montreal	110.00	....	....	.85z	1.50z	5.25z	8.20o	.....	.....	1.17j	3.11j
New Orleans	101.50	1.45	2.42	.53	.965	5.13	....	300.00bb	500.00bb	.65	2.29
New York	111.35	1.47	2.20	.61	1.18	4.68	12.15	.....	.....	1.15	3.00
Philadelphia	110.00	1.45	2.20	.65	1.25	4.95A	12.65A	300.00‡	350.00‡	1.55k	3.75k
Pittsburgh	110.00	1.47	2.20	.428m	.794m	2.97m	7.92m	152.00	244.00	1.05k	2.50k
St. Louis	112.00	1.45	2.29	.56	1.03	4.22	9.80	180.00l	380.00l	1.20il	2.85kl
San Francisco	127.00	1.53	2.29	.61d	1.20d	5.03d	12.57d	240.00l	400.00l	.73	3.02
Seattle	122.00	1.54	2.42	.51b	.91b	....	....	150.00c	.....	.85ee	2.56ee

*WROUGHT STEEL PIPE (Full standard weight) Discount from list; see footnote

Mill	Butt Weld, Black %	Butt Weld, Galv. %	Lap Weld, Black %	Lap Weld, Galv. %
Lorain, Ohio	36 75	20 00	27 75‡	11 00‡
Aliquippa, Pa.	36 75	29 50	27 75‡	11 00‡
Sparrows Pt., Md.	34 75	18 00	22 75‡	5 50
Benwood, W. Va.	36 75	20 00	26 50‡	9 25‡
Youngstown, O.	36 75	20 00	26 75ab	9 50a
Indiana Harbor, Ind.	35 75	19 00	26 75ab	9 50ab
Sharon, Pa.	36 75	20 00	27 75‡	11 00‡
Wheatland, Pa.	36 75	20 50	26 50‡	7 75‡
Etna, Pa.	36 75	18 50b	26 50‡	7 75‡
Fontana, Calif.	23 75b	10 00b	14 75ab	0 50ab

Mill	2½ & 3 in. Butt Weld‡ Galv. %	3½ to 6 in. Lap Weld‡ Galv. %
Lorain, Ohio	36 75	27 75‡
Aliquippa, Pa.	36 75	27 75‡
Sparrows Pt., Md.	36 75	27 75‡
Benwood, W. Va.	36 75	27 75‡
Youngstown, O.	36 75	27 75‡
Indiana Harbor, Ind.	35 75	27 75‡
Sharon, Pa.	36 75	27 75‡
Wheatland, Pa.	36 75	27 75‡
Etna, Pa.	36 75	27 75‡
Fontana, Calif.	23 75b	14 75ab

‡ Threaded and coupled. *a* 3½ to 4 in. *b* Continuous weld. *c* 5 and 6 in. *d* 6 in.

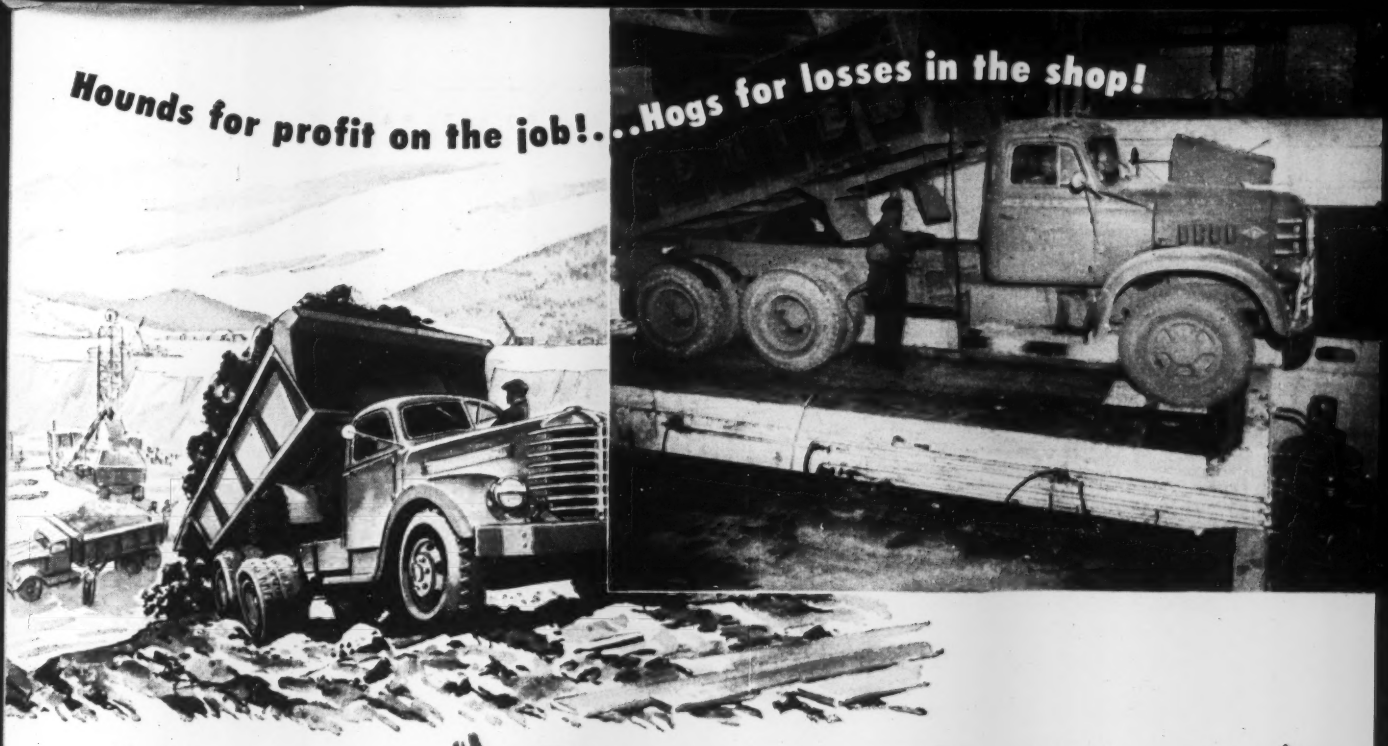
‡ Delivered. *a* Class B & heavier. Based on existing freight rates; subject to rate change. Gas pipe and class A, $5 per ton additional. 4 in., $7 per ton additional. 30 in. and larger, usually, $1 per ton less. *b* Extra strength ASTM C 200–44T. *c* 4-in., $90. *d* 8836l-A. *e* 30-in. *f* F.o.b. factory. *g* Culvert pipe. Reinforced, ASTM C76–41. *h* Reinforced, ASTM C75–41. *i* Reinforced, ASTM C76–37. *j* Centrispun. No. standard specifications in Can. *l* F.o.b. plant. *m* Truck delivery. *o* Listed price is based on LCL (no minimum). *p* Less than 5 tons, per price per ft. *t* Within switching limits. *u* ASTM C13–40. *v* C.L.f.o.b. origin, freight allowed. *x* 2 ft. lengths. *y* 3 ft. lengths. *z* CESA A 60–1941 specifications used. *aa Extra strength ASTM C–200–50.* A standard strength. * 6", $1.67 per ft.; carlots, F.o.b. track Class 150. *bb* Freight allowed to destination in city. *cc* Truck loads; f.o.b. plant, Newton. *dd* LCL delivered, f.o.b. truck. *ee* 1% off for cash. *ff* 21.

* WROUGHT STEEL PIPE: Deduct discounts shown above from the following standard list consumers carload prices to get mill price. List prices per ft. (based on approx. $200 per net ton): *Butt Weld* ¼ in. 54¢; ⅜ in., 64¢; ½ in., 84¢; ¾ in., $1.11; 1 in., 1.64; 1¼ in., 2.23; 1½ in., 2.67; 2 in., 3.47; 2½ in., 5.83; 3 in., 7.61. *Lap Weld* 3½ in., 9.92; 4 in., $1.09; 5 in., $1.48; 6 in., $1.92. Add freight rates plus 3% transportation tax to get destination price.

WROUGHT IRON PIPE: List prices per ft. same as for wrought steelpipe, but add following "discounts" to get Pittsburgh mill price: *Butt Weld* — 1 in. black, + 32.75, galv. + 57.0; 1¼ in. black, + 32.75, galv. + 56.5, 1½ in. black, + 29.25 galv. + 52.75; *Lap Weld* — 2½ in. to 3 in. black + 33.50 galv. + 55.5; 4½ in. to 6 in. black + 30.50 galv. + 50.75. Add freight rates plus 3% transportation tax to get destination price.

(Continued on page 149)

Hounds for profit on the job!...Hogs for losses in the shop!



Alemite "Friction Fighters"

speed lubrication of Edmier trucks in the shop ...save hours on the job!

Time is money when these big babies lie around the shop – and even more costly is a needless breakdown in the field. Avoid both kinds of expensive down-time by getting rid of out-of-date lubrication methods.

That's what the Edmier Company of Chicago did when they installed time-saving Alemite equipment in the central shop. Keeping a fleet of 155 dump trucks, tractors, graders, loaders and motorized equipment on the job is no cinch. But with thorough Alemite lubrication a *must* on every work sheet – down-time is slashed to the bone!

Edmier, like countless other successful construction firms, found that with Alemite "Friction Fighters" on the job, they save THREE ways!

1. Save Time! Equipment is in and out in a hurry, efficiently protected, back on the job.

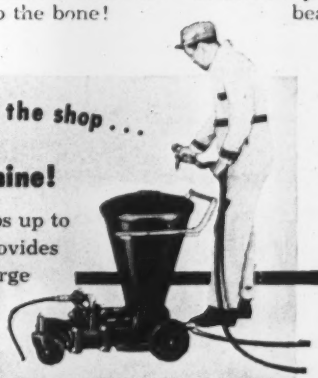
2. Save Money! By cutting lubrication down-time you increase output of *both* men and machines – slashing operating costs!

3. Save Equipment! By greatly reducing the chance of bearing failure – by keeping rigs running longer.

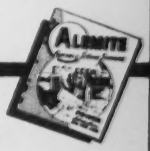
On the toughest jobs . . . Alemite lubrication protects expensive equipment, even where grit and dirt threaten bearings at every turn. Whatever your lubrication problem there is Alemite lubrication equipment to meet it. Write today. Find out how Alemite "Friction Fighters" can save your time – money – and machines!

for high pressure lubrication anywhere in the shop . . .

takes lubrication right to the machine!



This portable, high-pressure lubricator develops up to 5,000 lbs. pressure. Exclusive construction provides positive delivery even with heaviest greases. Large rubber-tired wheels plus compact design make it highly maneuverable. Travels easily over rough floors and into cramped areas. 40 lbs. capacity, serves many bearings without refilling. It's Alemite Model 6288, "Rockcrusher."



ALEMITE, Dept. W-93
1850 Diversey Parkway, Chicago 14, Illinois

Gentlemen:
Please send me your illustrated booklet containing complete information on Alemite equipment.

Name .....

Company .....

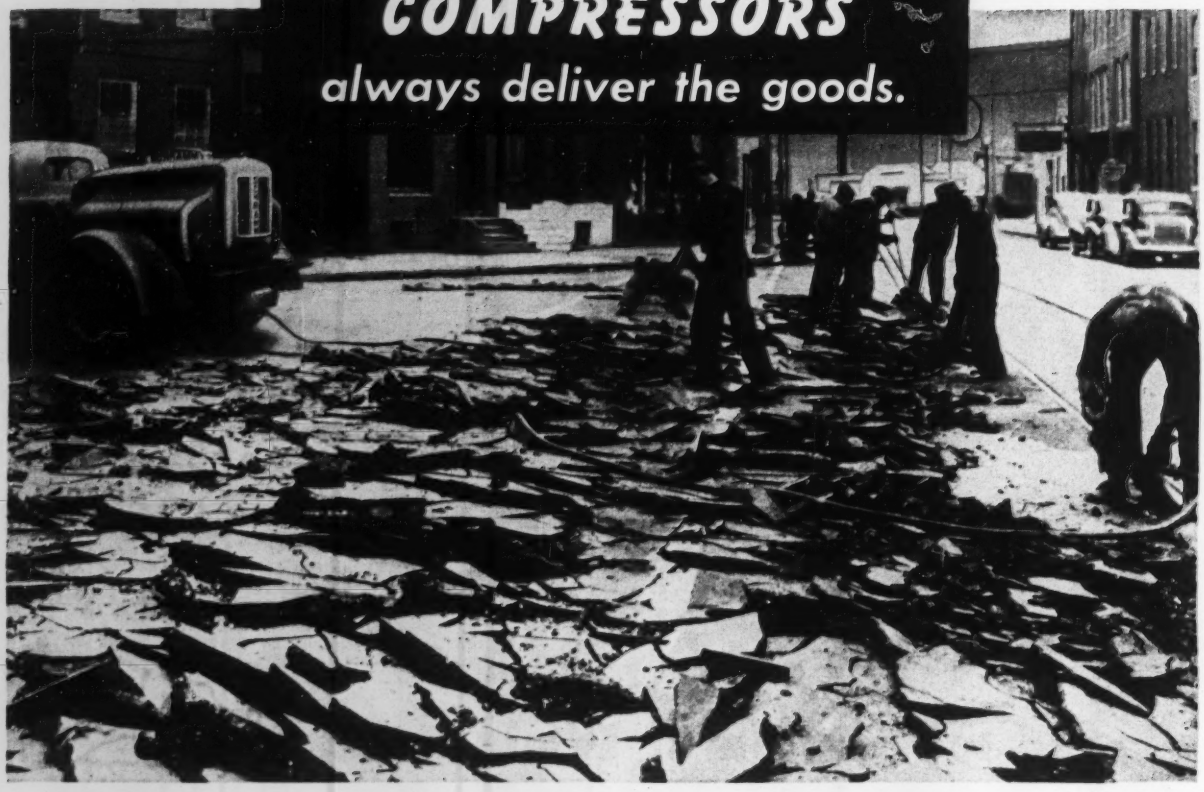
Address .....

City ..... State .....

ALEMITE

A PRODUCT OF SW STEWART WARNER

SCHRAMM COMPRESSORS always deliver the goods.



105 *UniStage* Compressor operating two heavy-duty paving breakers on important street job . . .

Busy thoroughfares require constant attention and maintenance, and dependable equipment that will guarantee quick results at the least possible cost.

On this job the SCHRAMM 105 truck mounted *UniStage* compressor operating two 80 pound paving breakers is cutting the asphalt surface on a busy street in the City of Baltimore, Md.

With a background of over fifty-three years' experience in the research, design, manufacturing and servicing of air compressors and tools, SCHRAMM, INC. is qualified to guarantee their products will always DELIVER THE GOODS.

Write for Catalog 5101-A

TOOL SELECTOR

Here is a helpful way of determining tool capacities that removes all doubt and confusion in selecting the proper combinations for your job, no matter how large or small.

Sent FREE upon request.

Write on your business letterhead or enclose business card and address reply to SCHRAMM, INC., Dept. SMH, West Chester, Pa.

SCHRAMM, INC. • *The Compressor People* • WEST CHESTER, PENNSYLVANIA

SCHRAMM AIR COMPRESSORS

A SIZE AND MODEL FOR EVERY AIR NEED

LUMBER, TIMBER, PLYWOOD—PER M FT., B.M., CARLOAD LOTS F.O.B.

SHORT LEAF YELLOW PINE AND DOUGLAS FIR

All S. L. Y. P. is No. 2 common or better and for No. 1 N. C. Box. (Prices in Bold Face)
All Fir boards, dimensions, planks No. 2. Fir small timbers and timbers are No. 1 Lengths up to 20 ft.
(Prices in italics)

	1x6 s4s	1x8 s4s	2x4 s4s	2x6 s4s	2x8 s4s	2x10 s4s	3x12 Rgh	6x12 Rgh	12x12 Rgh
Atlanta	†$79.00	$82.50	$73.50	$76.00	$79.50	$83.00	$81.00	.....	.....
Baltimore	* 88.00	92.00	75.00	75.00	75.00	82.50	111.50	.....	.....
	103.00g	*103.00g*	*94.50g*	*94.50g*	*94.50g*	*94.50g*	*98.00*	*$105.00*	*$105.00*
Birmingham	† 80.50	82.50	70.50	80.50	83.50	85.50	95.50	.....	.....
	88.50	*88.50*	*77.50*	*79.50*	*78.50*	*78.50*	*83.50*	*85.50*	*85.50*
Boston	94/99a	94/92a	90/98*	92/100*	95/102a	98/110a	.....	.....	.....
	§ *90.00**	*90.00*	*84.00*	*98.00*	*98.00*	*98.00*	*100.00*	*108.00*	*110.00*
Chicago	** 94.00	98.00	85/86	94.00	96.00	.....	104.00	.....	.....
	94.00	*94.00*	*97.00*	*98.00*	*99/100*	*101/102*	*107.00*	*107.00*	*107.00*
Cincinnati	* 96.00	102.00	85.50	95.00	102.00	104.50	118.75	.....	.....
	106.25	*106.25*	*108.00*	*106.50*	*108.00*	*106.25*	*133.00*	*133.00*	*133.00*
Cleveland	** 90.00	92.00	85.00	90.00	90.00	98.00	.....	.....	.....
			95.00	*94.00*	*95.00*	*95.00*	*108.00*	*108.00*	*108.00*
Dallas	k† 78.00	80.00	69.00	58.00	59.00	59.00	.....	.....	.....
Denver	*	*Not in stock*	*109.00*	*109.00*	*112.00*	*110.00*	*122.00*	*135.00*	*140.00*
Detroit	‡ 110.00	115.00	101.00	110.00	114.00	116.00	.....	.....	.....
	98.50	*99.50*	*101.50*	*102.25*	*101.25*	*100.00*	*110.50*	*122.50*	*122.50*
Kansas City	* 107.50	107.50	102.50	105.00	108.00	.....	.....	.....	.....
	105.00	*105.00*	*105.00*	*105.00*	*105.00*	*107.50*	*130.00*	*132.50*	*132.50*
Los Angeles	l *84.00*	*84.00*	*84.00*	*84.00*	*84.00*	*84.00*	*110.00*	*115.00*	*110.00*
Minneapolis	# *135.00*	*135.00*	*135.00*	*135.00*	*135.00*	*135.00*	*155.00*	*155.00*	*155.00*
Montreal	ab90.00	92.00	92.00	92.00	102.00	102.00	.....	.....	.....
	165.00	*165.00*	*165.00*	*165.00*	*165.00*	*165.00*	*165.00*	*165.00*	*165.00*
New Orleans	† 100.00	100.00	92.50	85.00	90.00	94.00	118.00	.....	.....
	† *97.00*	*101.00*	*109.50*	*109.50*	*107.50*	*107.25*	*107.50*	*117.50*	*107.50*
New York	j 107.50	110.00	115/120	120/125	120/125	125/130	155/165	.....	.....
			Range from $120.00 to $125.00				*135/150*	*149/159*	*149/159*
New York	** 88.00	90.00	80.00	89.00	90.00	92.00	130.00	.....	.....
	90.00	*90.00*	*92.00*	*93.00*	*93.00*	*93.00*	*105.00*	*110.00*	*110.00*
Philadelphia	‡		**Range from $110.00 to $127.00**				110/127	.....	.....
			Range from $120.00 to $150.00				*130/140*	*150.00*	*150.00*
Pittsburgh	†		**Range from $90.00 to $95.00**			.....	110/120	.....	.....
			Range from $110.00 to $120.00				*130/140*	*140/155*	*140/155*
St. Louis	‡c110.00e	112.00e	100.00d	107.00d	115.00e	119.00e	.....	.....	.....
			112.00e	*117.00e*	*117.00e*	*119.00e*	*150.00e*	*165.00*	*195.00*
San Francisco	A† *59.00*	*59.00*	*60.00*	*60.00*	*59.00*	*58.00*	*58.00*	*58.00*	*58.00*
Seattle	† *75.00g*	*75.00g*	*75.00g*	*75.00g*	*75.00g*	*75.00g*	*85.00g*	*85.00g*	*85.00g*

	LONG LEAF Y. P. Merchantable grade up to 20 ft.		PLYWOOD Rail freight increment (See note for base prices	
	2x12 Rgh	12x12 Rgh	¾"	¾"
Atlanta	.....	.....	$22.32	$27.24
Baltimore	$155.00	$155.00	25.92*	31.60*
Birmingham	115.50	155.50	21.78	26.58
Boston	.....	.....	25.92*	31.60*
Chicago	132.00	132.00	22.45*	27.37*
Cincinnati	140.50	140.50	25.00*	30.48*
Cleveland	.....	.....	25.37*	30.93*
Dallas	97.00	98.00	18.72	22.80
Denver	.....	.....	13.92	16.98
Detroit	.....	.....	25.00*	30.48*
Kansas City	.....	.....	16.56	20.16
Los Angeles	.....	.....	16.61*ab	20.25*ab
Minneapolis	.....	.....	19.89*	24.25*
Montreal	.....	.....	.....	.....
New Orleans	150.00	148.00	18.72	22.80
New York	220/240	220/240	25.92*	31.60*
New York	190.00	190.00	.....	.....
Philadelphia	210/220	210/220	25.92*	31.60*
Pittsburgh	110/120	115/125	25.92*	31.60*
St. Louis	.....	.....	18.72	22.80
San Francisco	.....	.....	12.22*a	14.91*a
Seattle	.....	.....	.....	.....

† F.o.b. mill. * F.o.b. city, CL, out of yard. ** F.o.b. city, CL, direct mill shipment. ‡ Deliv. to contr. CL. 1. Retail, LCL, at yard. # Retail, LCL, deliv. 2. Deliv. truck lots. 3. add.

LUMBER: **Bold Face type, Southern Pine.** *Italics, Douglas Fir.* *a* Spruce *b* Tax exempt. *c* 5M lots. *d* 8-12 ft. lengths. *e* 8-16 ft. lengths. *f* 18 ft. or under. *g* No. 1 common. *i* 8 ft. lengths. *k* No. 3 common: *l* 8-10 ft. lengths. *n* ¼" #1, ¼ #2 & ¼ #3.

A Rail freight rate from Northwest mills to San Francisco are $11.50 to $15.00 per M ft bm. From Northern Calif. mills $9.00 by rail, $9.50 by truck. All rates for surfaced stock. For rough, add $3.00 to above figures.

PLYWOOD: Plyform grade Fir Plywood, 4' by 8' panels, 5-ply, sanded 2 sides, water resistant glue, carload lots, delivered per 1,000 sq. ft. surface. Seattle base price on ½", $179.00; on ¾", $202.00. Exterior plyform ¾" $199.00, ¾" $223.00. For other centers add rail freight increment from table on proper size. Oiling and edge sealing charges included. *a* Lower rate by water shipment; *b* 50,000 lb. minimum.

* Incl. new freight rates. Rates for other cities not avail. as we go to press.

GLASS, EXPLOSIVES, CHEMICALS

	WINDOW GLASS: Discounts from jobbers list, Feb. 1, 1950*a* Single or Double Thickness A quality	B quality	EXPLOSIVES: Per lb. 40% Ammonia Gelatin in 50 lb. cases delivered in 200 lb. lots*
Atlanta	79%	80%	$0.2365
Baltimore	76%*d*	78%*d*	.2365
Birmingham	83%	83%	.1840
Boston	77-10%	77-10%	.2365
Chicago	76%	76%	.2365
Cincinnati	78%	78%	.2365
Cleveland	76-10-10%	76-10-10%	.2765
Dallas	75%	75%	.2440
Denver	80%	80%	.2415
Detroit	78-10-10%	78-10-10%	.2365
Kansas City	80-10%	80-10%	.2415
Los Angeles	73%	78%	.2390
Minneapolis	78-10%	78-10%	.2415
Montreal	40-5%*bc*	40-10-5%*b*	21.60*bi*
New Orleans	78%	77%	.2415
New York	80-10-5%	80-10-5%	.3975*g*
Philadelphia	78%	80%	.2365
Pittsburgh	82%	82%	.2090
St. Louis	80-10%	80-10%	.2415
San Francisco	70%	70%	.2365
Seattle	75%	78%	.2390

Price of 60% Ammonia Gelatin is $0.15 per lb. higher than 40%

Glass: a Jobbers' list price per box, 14 x 20, ss, $42.75 for A quality, $37.50 for B quality; 14 x 20, ds, $60.00 for A quality, $52.75 for B quality. *b* Discount from list, Apr. 1951; sales tax included, but 6% tax exemption not allowable for. *c* Single thickness. *d* Discount 6/15/52.

Explosives: * Urban prices influenced by service charges or local storage and delivery regulations do not consistently reflect quantity prices in less congested areas. *g* In borough of Kings, Queens, and Richmond and in Manhattan south of Canal St., add delivery charge of $20.00 per trip. *h* F.o.b. city per 100 lb. forcite, 40%. Forcite 60%, $23.35. *i* F.o.b. Beloeil (near Montreal).

40% Ammonia Gelatin price ranges in other than urban areas, per lb. (except Seismograph Grades)

	C/L 20,000 lb. net	Tons	200 lb. lots
E. of the Miss., except Fla. and Me.	$0.184	$0.2165	$0.2365
W. of Miss. to Rocky Mtn. States, Fla. and Maine	.189 - .1965	.2215- .229	.2415- .249
Rocky Mtn. States	.189 - .2015	.2215- .229	.2415- .254
Pacific N. W. States	.1865- .199	.219 - .2315	.239 - .2515
Pacific S. W. States	.184 - .1915	.2165- .219	.2365- .2415

PILES, TIES F.O.B.

PILES

Prices per linear foot, fir and pine, bark off, f.o.b. cars, New York. Fir based on Wash. and Ore. points to New York shipping area; pine based on freight from Norfolk.

Dimensions	Points	Length	By Rail: Pine*	By Rail: Fir
12-in. at butt	6-in.	30 to 50-ft.	$0.51	....
12-in.— 2-ft. from butt	6-in.	50 to 59-ft.	.54	....
12-in.— 2-ft. from butt	6-in.	60 to 69-ft.	.58	....
12-in.— 2-ft. from butt	6-in.	90 to 100-ft.	....	....
13-in.— 3-ft. from butt	5-in.	91 to 100-ft.	....	....
14-in.— 2-ft. from butt	6-in.	50 to 69-ft.	.50/.68	....
14-in.— 2-ft. from butt	6-in.	70 to 79-ft.	.78/.83	.93
14-in.— 2-ft. from butt	5-in.	80 to 85-ft.	.83/.93	.94
14-in.— 2-ft. from butt	5-in.	85 to 89-ft.	....	1.00
14-in.— 2-ft. from butt	5-in.	90 to 100-ft.	....	1.02

* Pine piling over 80-ft. available only in limited quantities.

RAILWAY TIES

Prices f.o.b. per tie for carload lots:		6"x8"x8' Untr.	6"x8"x8' Tr.	7"x9"x8'6" Untr.	7"x9"x8'6" Tr.
Boston	Oak	....	....	....	....
	Pine	....	....	....	....
New York	S. L. Sap Pine	$2.55	$4.35	$3.45	$5.45
	Mixed Oak	3.10	4.65	3.70	5.95
Birmingham	Hardwood	2.40	3.88*a*	2.85	4.58*a*
Chicago	Red Oak	....	3.40*a*	....	4.30/4.40*a*
Los Angeles	Douglas Fir	....	....	....	....
	Redwood	....	....	....	....
Philadelphia	Red Oak	2.55	3.90	3.45	5.10
St. Louis	White Oak	3.10	....	3.90	....
	Red Oak	3.00	3.75*a*	3.70	4.60*a*
	Sap Pine or Cypress	....	3.55*a*	....	4.50*a*
San Francisco	Douglas Fir	2.20*e*	3.25*af*	2.92*bf*	4.30*caf*
Montreal	Birch or Maple	....*h*	....*h*	....*h*	....*h*

Tr.— Treated; Untr.— Untreated. *a* Creosoted. *b* 7" x 9" x 8'. *c* Empty cell. *e* Green. *f* F.o.b. cars. *h* No constant price available. *i* Not available.

CHEMICALS

Water, sewage treatment, road work, f.o.b. carlots, New York

Bleaching powder in drums f.o.b. works, per 100 lb	$5.02
Chlorine cylinders, liquid, per lb. f.o.b. works	.0825
Calcium chloride, 77-80%, flaked, 100-lb. paper bag, f.o.b. works, ton	25.00
Silicate of soda, 52 deg., in drums, f.o.b. works, per 100 lb	2.30
Soda ash, 58%, in paper bags, per 100 lb. dense	1.75
Sulphate of aluminum, commercial, in 100-lb. bags f.o.b. works	1.85
Sulphate of copper, in bags, 99% per 100 lb. f.o.b. works	10.35

STRUCTURAL CLAY BUILDING TILE, BRICK AND LIME—DELIVERED

	STRUCTURAL CLAY TILE PARTITION — SCORED Per M. lots of 2,000 pieces or over, 3x12x12 in.	4x12x12 in.	8x12x12 in.	STRUCTURAL CLAY TILE — LOAD BEARING — SCORED Per M. lots of 2,000 pieces or over, 8x12x12 in.	10x12x12 in.	12x12x12 in.	BRICK Per M. in quantity Common backing	Straight hard	LIME Per ton, In paper, Carload lot. Hydrated finishing	Common hydrated	Pulverized, or lump
Atlanta	$195.00	$207.00	$247.50	$327.00	$342.00	$381.50	$27.38	$27.38	$19.00	$17.50	$17.50
Baltimore	186.00	198.35	372.00	421.50	549.00	627.00	36.00*k*	41.00*k*	32.00	21.50	....
Birmingham	126.00*o*	136.00*o*	....	284.00*p*	....	....	23.50*ff*	28.00*gg*	29.25	17.30	....
Boston	196.00†	209.00†	392.00†	383.25†	....	....	36.85*p*	39.85*n*	30.00†	28.00†	....
Chicago	135.00	145.00	280.00	....	....	....	26.00	28.00	30.80	26.00	....
Cincinnati	185.00*j*	195.00*j*	340.00*jdd*	....	....	....	40.00*j*	46.00*j*	26.00*j*	26.00*j*	....
Cleveland	172.00**	183.00**	....	....	....	....	34.50	34.50	28.25	23.25	32.00*ee*
Dallas	....	118.00	....	....	....	....	19.75	35.25	32.00	21.80	....
Denver	....	....	....	....	....	....	34.00	41.00	34.80*bb*	28.00*bb*	34.00*bb*
Detroit	127.75	136.25	255.55	....	317.25	362.60	37.50*cc*	35.60*cc*	33.50	31.50	....
Kansas City	127.50	147.50	270.00	270.00	340.00	400.00	28.50	....	32.00	26.00	28.50
Los Angeles	*r*	*r*	*r*	*r*	*r*	*r*	27.50‖	....	34.00	34.00	35.00
Minneapolis	172.00*p*	193.00*p*	400.00*p*	193.00*an*	....	....	34.00*w*	43.00	39.00*bbe*	29.00*bbe*	41.00*bbde*
Montreal	165.00*aq*	181.00*au*	325.00*au*	230.00	248.00	....	38.50	48.00	34.80	32.50	26.00*u*
New Orleans	170.00	170.00	310.00	380.00	....	....	31.00	....	....	28.00	28.00
New York	140.90*h*	150.30*h*	266.70*ch*	225.50*hn*	....	....	35.00	....	36.00	32.00	....
Philadelphia	145.30	155.00	290.60	348.70	....	....	30/34	35/42	25.00	23.00	2.97
Pittsburgh	112.00	117.00	189.00	216.00	279.00	317.00	36.00	46.00*y*	25.00	23.00	2.97*m*
St. Louis	142.00*cc*	165.00*cc*	316.00*cc*	465.00*cc*	439.00	621.50	40.00*al*	36.00*s*	.90*aaa*	.70*aaa*	1.10*aaapes*
San Francisco	156.85*	177.10*	235.30*dda*	....	....	....	37.00	....	26.60	26.60	2.65*m*
Seattle	223.00*cc*	230.00*cc*	....	240.00*ccw*	....	....	39.00*s*	49.00*s*	37.50*aaa*	1.50‡	3.90*mhh*

† F.o.b. yard Roxbury. *a* Smooth. *b* Per 50 lb. bags. *c* 6 x 12 x 12 in.-3 cell. *d* Pulverized hot. *e* 5%, 10th following month. *g* 5½ x 8 x 12. *h* F.o.b. trucks, job site N.Y.C. *j* Truck load or over. *k* $1.00 discount *l* Red face. *m* Per bbl., 180 lb. *n* 7½ x 7½ x 12. Speed title. *p* Truck lots. *q* Provincial and Municipal tax extra. *r* Not used because of earthquake danger. *s* 2% discount for cash. *t* 5½ x 8 x 11¼. *u* Tax exempt. *v* Sand lime. *w* 5 x 8 x 12. *y* Stacked. *z* Pebble lime price per 80 lb. sack. *aa* Price per sack. Lime not sold per ton. *bb* LCL. *cc* Truck delivery. *dd* 6 x 12 x 12. *ee* Pebble lime. *ff* 80% common. *gg* Select. *hh* LCL. ‖ F.o.b. yard. ‡ Per 60 lb. sack, no incr., ton price no longer quoted. ** Warehouse delivery. * F.o.b. Stockton.

PAINT, ROOFING—F.O.B. CARLOAD LOTS

	RED LEAD Per 100 lb. in 600-lb. (Approx.) bbl. Dry *a*	WHITE LEAD Per 100 lb. in 100 lb. cases in oil *w*	READY-MIXED PAINT Per gal., drums Graphite *b*	Aluminum *c*	Ferric Oxide *d*	ROOFING SUPPLIES Carload lots f.o.b. factory Rolls, slate surfaced, 85–90 lb. per sq.	Asphalt felt, per 100 lb.	Tar felt, per 100 lb.	Asphalt coating per gal.	Tar pitch 360 lb. bbl per ton
Atlanta	$16.75	$28.275	$3.26	$3.51	$3.01	$2.74	$3.01	$2.98	$0.405	$39.75
Baltimore	16.50	27.90	2.65	4.10	3.22	2.66	4.43	4.43	.47	45.56
Birmingham	16.75	28.275	3.90	3.40	....	2.93	2.93	2.93	....	42.00*ee*
Boston	16.50	27.90	....	....	....	2.91*qq*	2.97*qq*	2.97*qq*	.42*g*	45.70*q*
Chicago	16.50	27.90	....	....	....	3.29‡*u*	3.29‡*o*	3.29‡*o*	38.00‡*bbr*	48.00‡
Cincinnati	16.50	27.90	....	....	....	2.66	2.66	2.66	.46*y*	46.56
Cleveland	16.50	27.90	2.31*pqq*	2.78*qq*	2.45*qq*	2.83*q*	2.83*o*	2.83*o*	.43*y*	40.70*hh*
Dallas	16.75	28.65	....	4.05	....	3.50*q*	3.75*o*	4.35*o*	.36	58.50*hh*
Denver	17.00	28.40	3.07	5.15	2.87	2.66*o*	2.61*o*	2.61*o*	.43*ff*	47.00
Detroit	16.50	27.90	2.35	3.25	2.50	2.83	2.66*f*	2.66	.51	44.00
Kansas City	16.50	28.65	....	2.71*ps*	2.65	2.93	2.93*o*	2.93*o*	.43*	53.00
Los Angeles	16.50	28.15	3.30*	4.50*	4.20*	2.48*	1.66*ee*	1	.55*	*l*
Minneapolis	16.50	29.88 28.02	....	....	....	2.66*idd*‡	2.66*hidd*	2.66*hidd*	.44*idd*	42.00*r*
Montreal	....	21.15	2.98*Dff*	4.05*#ff*	3.25*#ff*	4.85*t*	3.65*tf*	3.65*tf*	1.24*kt*	3.78*kt*
New York	16.50	27.90	....	....	....	2.79*a*	2.74*ao*	2.74*ao*	44*oz*	42.00*
Philadelphia	16.50	27.90	3.25	3.65	3.15	2.54	2.94	2.94	37	26.00
Pittsburgh	16.50	27.90	2.65	2.85	3.15	2.85	3.00*o*	3.00*o*	35	43.00
St. Louis	16.50	27.90	....	....	....	2.67	2.67*h*	2.67*h*	39*y*	41.70
San Francisco	16.50	28.15	2.40	....	3.40	2.95	4.00*aa*	....	49	....
Seattle	16.50	28.40	2.96*m*	2.80*m*	....	3.58*mqcc*	3.05*hmcc*	....	59*mcc*	52.60*jmc*

‡ Delivered. Note: Red lead in oil 50c higher than white lead in oil. *a* Red lead prices change frequently due to pig lead price changes. *b* U. S. War Dept. Spec. 5-49A. *c* ASTM Spec. D266-31. *d* 80% minimum ferric oxide. *e* 15 lb. *f* Per 432 sq. ft. *g* F.o.b. yard, Roxbury. *h* Per roll, 65 lb. *i* Net carload lot prices; Minneapolis and vicinity. *j* Asphalt pitch. *k* Per cwt. *l* Not used. *m* 1% discount for cash. *n* F.o.b. city. *o* Per 60-lb. *p* 6-drum, 50 gal. ea. *q* Per 90-lb. roll. *r* F.o.b. factory Chicago. *s* 466 Med. *t* Federal tax included. *u* Per 90 lb. square. *v* Per ton. *w* Price to large paint contractors is $1.25 less. *x* Mineral surfaced. *y* 55-gallon container. *z* Drums. *aa* Approximate cost per 100 lbs. *bb* Roofers coating and cement. Price per ton. *cc* LCL, truck delivery. *dd* 2% cash discount. *ee* Asphalt, in 100 lb. package. *ff* 5-gal. drums. *gg* F.o.b. factory. *hh* Incl. freight. *D*, Std Black. *E* Ready-mixed. *F*, Over 80% ferric oxide. * Aver. wt. approx. 500 lbs. *q* Freight allowed to destination not exceeding .50 cwt.

SKILLED AND COMMON WAGE RATES—PER HOUR

	Brick-layers	Car-penters	Struct. Iron Workers	Hoisting Engineers	Plas-terers	Electrical Workers	Steam-fitters	Common Labor Building	Common Labor Heavy Const.
Atlanta	$3.10	$2.50	$2.75	$2.50	$2.90	$2.75	$2.90	$1.28	$1.28
Baltimore	3.20*d*	2.75	3.275*	3.10/3.25	3.075*	2.875	2.975*	1.675*	1.675*
Birmingham	3.00	2.24	2.90	2.16	2.62	2.875	2.80	1.30	1.40
Boston	3.185*	2.75	3.075*	3.00	3.20*	3.10*d*	2.95*	1.99*	1.99*
Chicago	3.40*k*	3.15*	3.20*	3.00*m*	3.525*	3.37*	3.24*	2.35*	2.35*
Cincinnati	3.225	2.875	2.915	2.70/2.95	3.05	3.00	3.05	2.02	2.02
Cleveland	3.25*	3.20*	3.20*	3.20	3.20	3.20	3.20*	2.45	2.45
Dallas	3.50	2.625	2.75	2.75	3.437	2.90	2.90	1.40	1.35
Denver	3.50	2.775	2.75	2.705	3.30	3.00	2.97	1.80	1.80
Detroit	3.30*	3.08*	3.23*	3.23*	3.32*	3.22*ll*	3.075*	2.28*	2.28*
Kansas City	3.625	2.675	2.805	2.64/2.885	3.25	2.90	2.90	1.98	1.98
Los Angeles	3.285*o*	2.70	2.925*	2.87	3.437	3.10	3.125*	2.05	2.05
Minneapolis	3.125	2.70	2.82	2.65	2.90*	3.00*n*	2.875	1.95	1.95
New Orleans	3.05	2.42	2.80*	2.60	2.625	2.925*	2.75*	1.375	1.375
New York	3.874*le*	3.43*bl*	3.656*l*	3.69*l*	4.00*l*	3.63*as#*	3.64*bL*	2.20	2.20
Philadelphia	3.61*	3.10	3.15*M*	3.35/3.50*	3.475*	3.45*	3.515*	1.875	2.175
Pittsburgh	3.475*	3.20*	3.225*	3.25*	3.30*	3.35	3.00	2.025*	2.025*
St. Louis	3.62*c*	2.975*	3.025*	3.00	3.25*	3.28*	3.05*#*	2.075*	2.075*
San Francisco	3.40*bk*	2.83	3.00	2.66	3.275*	3.175	3.275*K*	2.00	2.00
Seattle	3.30	2.58	2.78	2.71	3.15	2.80	2.75	2.18	2.14
Montreal*†	2.90	1.80	1.90	1.70	2.00	1.90	1.95	1.25	1.25

* Cost of living bonus now included in basic wage. † Includes 5¢/hr tool replacement. † Plus 2% vacation pay.

a 6 hr. day. *b* 7 hr. day. *c* Incl. 3% vac. stamp fund plus 7¢ WF for bricklayers; 4% VF for electricians plus 8¢ WF, 1% PF. *d* Incl. 10¢ H&WF. *e* Incl. 6¢ H&WF. *f* Incl. 6% WF. *g* Incl. 11½¢ WF. *h* $2,625 homes & housing plus 7½¢ VF. *i* Incl. 3½% WF and 15¢ PF. *j* Incl. 10½¢/hr WF. *k* Incl. 7½¢/hr WF. *l* Incl. 4% VF. *m* Incl. 5¢ hr WF. *n* Incl. 20¢ H, W, Ins., Vac. & Retirement. *o* Incl. 10¢ PF, 8¢ WF. *p* Incl. 3% WF, 3% PF. *q* Incl. 3½% WF and 20¢ PF. *r* Incl. 5% W&PF, 4% VF, 1% NC, 6 PH. *s* Incl. 7½¢ H&WF. *t* Incl. 11½% WF. *u* Incl. 10¢ WF. *v* Negotiating. *x* Incl. 8¢ WF. *y* Incl. 22½¢ WF. *z* Incl. 7½¢ IF, 5¢ H&WF. *A* Incl. 10¢ WF, 10¢ PF & 20¢ B.F. *B* Incl. 3% WF, 6 PH. *C* Incl. 2½¢ H&WF. *E* Plus 5% WF, plus travel pay per day. *F* Plus $1 per day travel time. *G* Incl. 11¢ H & WF. *H* Incl. 7¢ WF. *I* Incl. 15¢ H&WF. *J* Incl. 4% WF, 6PH. *K* Incl. 10¢ H&WF 10¢ VF, 2½% PF. *L* Incl 3% WF, 3% PF, 1% VF. *M* Incl. 7½¢ PF.

MEXICO CITY PRICES

In Pesos, F.o.b. City		July '53	Aug. '53
Common Wages—Building (8 hr. day)	av. per hr.	1.06*	1.06*
Common Wages—Heavy Const. (8 hr. day)	av. per hr.	1.25*	1.25*
Skilled Labor Wages			
Carpenters (8 hr. day)	av. per hr.	2.25*	2.25*
Bricklayers (8 hr. day)	av. per hr.	2.25*	2.25*
Struct. Iron Workers (8 hr. day)	av. per hr.	1.88*	1.88*
Struct. Steel Shapes			
3"-15" x 12 meters	per metric ton	1224.23	1224.23
Reinf. Steel, Corr. Rods			
⅜" x 11 meters	per ton	1386.77	1386.77
½" x 11 meters	per ton	1375.56	1375.56
⅝" x 11 meters	per ton	1364.35	1364.35
¾" x 11 meters	per ton	1353.14	1353.14
⅞" x 11 meters	per ton	1353.14	1353.14
1" x 11 meters	per ton	1353.14	1353.14
Gravel truck load of 3½ cu. meters			
Blue Gravel	per tr. load	55.00	55.00
Rose Gravel	per tr. load	52.00	52.00
Cement, Std. Port. (Tolteca)	per ton	180.00	180.00
Lumber			
Mex. Sacred Fir (OYAMEL)	per M ft.	750.00	750.00
1st Class Pine	per M ft.	1350.00	1350.00
2nd Class Pine	per M ft.	1100.00	1100.00

* Increase by 1/6th—work 6 days, paid for 7 days.

ENR Skilled Average: (Bricklayers, Carpenters, Iron workers): $3.075 **ENR Common Average:** $1.921

ANNOUNCING
THE DU PONT VOLTOHMETER

. . . a triple-purpose precision instrument for testing electric blasting operations

The Du Pont Voltohmeter is an entirely new, all-purpose precision instrument designed for testing in connection with electric blasting. It combines the functions of Du Pont Blasting Galvanometers, and Detect-A-Meters, and offers many other advantages.

1. **As a blasting galvanometer,** the Voltohmeter may be used to measure resistance of electric blasting caps, blasting circuits and firing circuits accurately. One dial setting has a range of 0 to 100 ohms, and another, from 0 to 1000. The scale is graduated for easier, more accurate reading, and a convenient zero-mark adjustment is provided.

2. **As a stray-current detector,** the Voltohmeter offers greater flexibility in detecting, tracing and identifying both AC and DC voltages. Separate scales are provided reading from 0-1.5 volts DC, 0-1.5 volts AC, 0-30 volts DC and AC and 0-600 volts DC and AC.

3. **As a voltmeter,** the new Voltohmeter may be used for testing all power-line voltages commonly used in electric blasting operations, up to 600 volts . . . both AC and DC.

Each Voltohmeter is in a sturdy leather carrying case with shoulder strap and pocket containing two plastic insulated probe wires with insulated alligator clips shown below. An instruction plate and pamphlet are also included. Compact, it measures only 6⅝ x 3⅞ x 4½ inches; weighs only 2½ pounds.

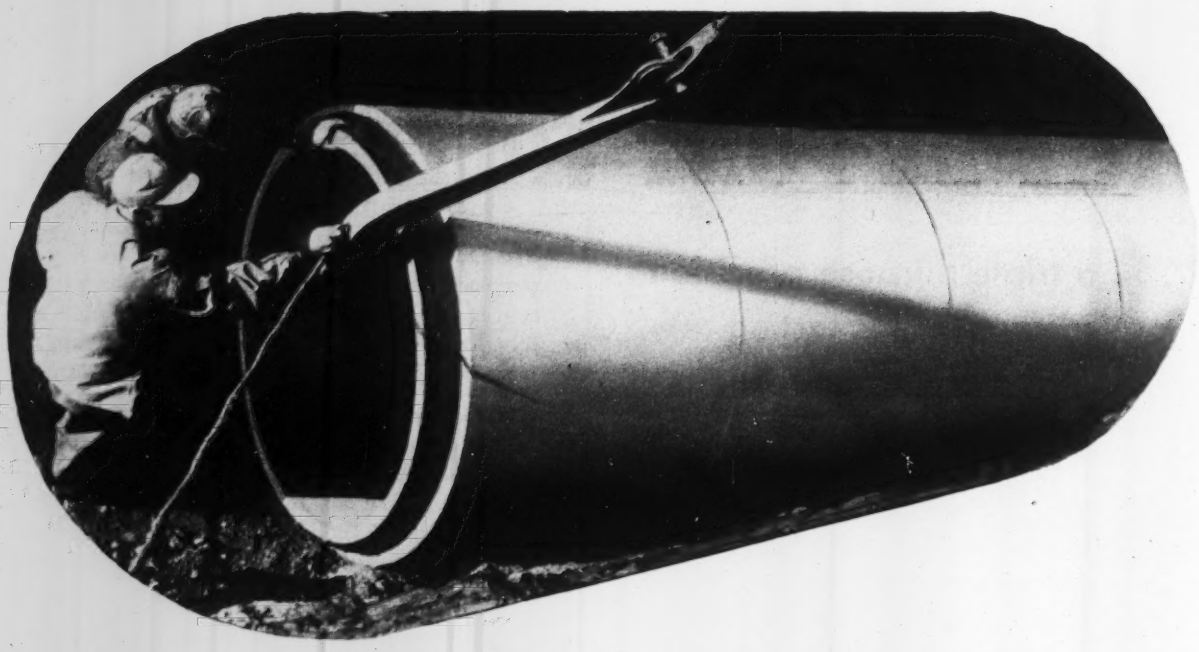
Ask the Du Pont Explosives representative in your district for complete information about this new, highly efficient, triple-purpose instrument for promoting safer blasting. E. I. du Pont de Nemours & Co. (Inc.), Explosives Department, Wilmington 98, Delaware.

DU PONT EXPLOSIVES

Blasting Supplies and Accessories

DU PONT
REG. U. S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*



WHY LEADING ENGINEERS AND CONTRACTORS SPECIFY UNIVERSAL VITRIFIED–UNITED STATES CONCRETE

Here is a complete line of quality products . . . both vitrified and concrete . . . produced by the most modern methods . . . carefully controlled from raw materials to the finished products.

Here is prompt delivery assured because of the eight strategically located plants.

Here is pricing that is always fair and equitable, reflecting the efficiency and economy of the most advanced manufacturing methods.

PRODUCTS

Sewer Pipe (Vitrified)	Slipseal Sewer Joint	Flue Lining
Sewer Pipe (Concrete)	Segment Sewer Block	Stove Pipe
Vitrified Liner Plates	Meter Boxes	Chimney Tops
Tylox Flexible Rubber Coupled Vitrified Pipe	Ship Lap Wall Coping	Chimney Pots
Aerodrane Filter Block	Septic Tanks	Fire Brick
	Drain Tile	Fire Clay

Vitrified Clay Plate Lined Concrete Pipe

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UNIVERSAL SEWER PIPE CORPORATION
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● ***GENERAL OFFICES*** • **1500 Union Commerce Building** • **CLEVELAND 14, OHIO**

Bids—Low Bids—Contracts—Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

September 15 Massachusetts

STREETS AND ROADS

September 15 Massachusetts

BIDS ASKED—BUILDINGS

Mass., Everett—HOUSING—B.A. 9/17—City, Everett Housing Auth., 48 Elm St., 64 veterans housing units, Proj. Mass. 200-3, $900,000. Plans deposit $100, refundable. William W. Drummey, 80 Boylston St., Boston, archt. CD 11/25.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Bay Shore Realty Co.**, 90 Calverly St., Providence, R. I. Owner Builds. **$2,800,000.** HOUSING DEVELOPMENT, off Camp Ave., NORTH KINGSTON, R. I. Architects Collaborative, 95 Mt. Auburn St., Cambridge, Mass., archts.

▲ **Boswen Contr. Corp.**, c/o Ryder, Struppmann & Neumann, archts., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. **$4,500,000.** 300 HOUSES on tract on West Rocks Rd. to be called Suburban Heights, NORWALK, CONN.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

September 15 Maryland September 21, 28 New Jersey

BIDS ASKED—BUILDINGS

▲ **Del., Wilmington**—HOSPITAL—Bids Asked—The Memorial Hospital, 1501 Van Buren St., hospital addns., alterations, $3,500,000. York & Sawyer, 101 Park Ave., New York, N. Y., archts. CD 3/23.

SOON LETS CONTRACT—BUILDINGS

▲ **Pa., Wynnewood**—STORE—At office Wallace & Warner, archts. and engr., 1400 S. Penn Square, Phila., soon lets contract department store for Main Line Shopping Center, Inc., c/o James M. Brittain, Provident Trust Bldg., Phila. $1,500,000. Wanamakers, lessee.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, **Merritt-Chapman & Scott Corp.**, 260 Madison Ave., New York 16, N. Y., CA **$2,470,724,** est. $2,473,000. 1.34 mi. New York State Thruway-Hudson Sect. Sub. 9B Tappan Zee Bridge, HT 53-6, Westchester and Rockland Counties. Bids Aug. 6. CD 8/11, under LB.

▲ **NEW YORK**—Bureau Contracts & Accounts, The Governor Alfred E. Smith State Office Bldg., Albany, **John Arborio, Inc.**, W. Cedar St., Poughkeepsie, N. Y. and **Corbetta Constr. Co., Inc.**, 220 E. 42 St., New York, N. Y., CA **$11,487,198,** est. $11,597,000, c. conc. 13.03 mi.; b. conc. Type 1A, opt 0.31 mi.; T.C. graded grav., D.S.T. 226 mi; 5 H.G.S. comp. I-beams 276.3 ft., 197.7 ft., 198 ft., 304 ft. and 199.5 ft., 1 H.G.S. welded girder and comp. I-beams 75.9 ft., 2 bridge plate girder comp. I-beam cantilever 540 and 356 ft., New York State Thruway-Catskill Sec.-Sub. 4, (New Paltz-Whiteport); Rte. 299 Interchange: Highland-New Paltz H-1536; Kingston High Falls SH 229; eight town or country roads, Contr. CT 53-10, S.T. 53-26, RC 5-103, Ulster Co. Bids Aug. 6. CD 8/10, under LB.

▲ **NEW JERSEY**—State Hy. Dpt., 1035 Parkway Ave., Trenton,
A. J. Cunningham & Sons, 370 Newkirk Ave., Trenton, N. J., CA, **$1,784,997,** 0.965 mi. Route 26 Extension Section 3-A from Strawberry St. to Whitehead Road, Lawrence and Hamilton Twps., Mercer Co. Bids Aug. 18, awarded Aug. 28. CD 8/24, under LB.

▲ **NEW JERSEY**—State Hy. Dept., State Hy. Office Bldg., 1035 Parkway Ave., Trenton.
D. Cutrupi & Sons, Inc., 2156 N. Hoyt Ave., Fort Lee, N. J. and **Gallo Asphalt Co.**, 32 Woolson St., Irvington, N. J., CA, **$1,810,617** grading, paving 1.476. Section 1-J Palisades Interstate Parkway from Station 505-0 to N. Y. State Line Alpine Borough, Bergen Co. Bids Aug. 25, awarded Aug. 27. CD 8/6.
War Memorial Building Comn., War Memorial Bldg., Trenton, N. J., rejected bids Aug. 19, memorial stadium, Parkside Ave. at Buttonwood Dr. Ewing Co., Mercer Co., TRENTON, N. J. LB **$787,000.** CD 9/1, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., 506 N. Office Bldg., Harrisburg,
Jack & Jim Maser, Inc., Box 116, Brownstown, Pa., CA **$633,472,** relocate for nearly 3 mi. and constr. crushed aggregate base with bit. surf. 22 ft. wide, 3 rein.-con. culverts and I-beam bridges over Northkill and Little Northkill Creeks 5.44 mi. from Obald, northwest through Bernville and northwesterly, T.R. 83, Berks Co.;
B. G. Coon Constr. Co., 278 Union St., Luzerne, Pa. CA **$547,829,** 2 addnl. traffic lanes with precast divisor of rein.-con., 25 ft. wide and 3.49 mi. long, constr. two plate girder overhead bridges between Nanticoke and Wilkes-Barre, Luzerne Co. Bids Aug 21. CD 8/27, under LB.

▲ **PENNSYLVANIA**—State Hy. Dpt., North Office Bldg., State Capitol, Harrisburg,
New Enterprise Stone & Lime Co., Inc., New Enterprise, Pa., LB **$73,131,** const. 0.37 mi. two-lane hy., creating a four-lane roadway from Altoona south, by extending present concrete roadway and bit. surf. T.R. 36, in City of Altoona and Logan Twps. Blair Co.;
General Asphalt Paving Co., 6851 Rising Sun Ave., Phila., 11, Pa., LB **$237,242,** constr. 0.36 mi. bit. surf. on concrete base and vitri. pavement in Independence Mall area, L.R. 67005-6, Market, Chestnut, 5 and 6 Sts. in Phila., Philadelphia Co.;
Edward A. Daylor, Inc., Box 551, Coatesville, Pa., LB **$339,987.** widen to 20 ft. and apply bit. surf. on present inadequate 14-ft. roadway and new sect. for 2.61 mi. between Strasburg and Lincoln Hy. L.R. 36011, Strasburg and East Lampeter Twps. Lancaster Co.;
E. M. Brown, Inc., 11 Guelich Ave., Clearfield, Pa., LB **$259,750,** widen pavement to nearly 6 ft. and bit. surf. new base and existing pavement 3.69 mi. from near Rixford, westerly toward T.R. 96, T.R. 246 in Otto and Foster Twps., McKean Co.;
Dinardo, Inc., 331 Bouquet St., Pittsburgh 13, Pa. LB **$2,502,618,** constr. 2.64 mi. nine in. rein.-con. four-lane roadway with divisor of varying width T.R. 88 between Emsworth and Glenfield Boros, Alleghany Co. Bids Aug. 28. CD 8/18.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **Eastwood Village Homes**, c/o Matern & York, archts., 90-05, 161 St., Jamacia, N. Y. Owner Builds. **$15,000,000.** 1500 HOUSES on 400-acre tract, north side of Jericho Turnpike, CENTEREACH, N. Y.

▲ **East Meadow Lawns**, c/o Alwin Cassens, Jr., archt., 145 S. Franklin Ave., Valley Stream, N. Y. Owner Builds. **$2,500,000.** 155 HOUSES, 40-acre tract, Bellmore Rd. and Grove Ave., EAST MEADOW, N. Y.

▲ **Marbie Hills Homes**, c/o Morris Lapidus, archt., 256 E. 49 St., New York 17, N. Y. Owner Builds. **$3,500,000.** 150 HOUSES, 70-acre tract, Youngs Hill Rd., HUNTINGTON, N. Y.

11 East 87 Corp., c/o Tito DiVincenzo, archt., 2 Columbus Circle, New York 19, N. Y. Owner Builds. **$900,000.** 12 story APARTMENT for 92-families, 11-17 E. 87 St., NEW YORK, N. Y. CD 6/4.

Virginia Park Homes, c/o John W. Burton, archt., 163-18 Jamaica Ave., Jamaica, N. Y. Owner Builds. **$900,000.** 80 HOUSES on tract on Boundary Ave. east of Hicksville Rd., PLAINEDGE, N. Y.

▲ **Sun Valley Homes**, c/o Harry Maslow, archt., 275 Morris Ave., Elizabeth, N. J., owner Builds, **$1,500,000,** 100 HOUSES on tract on Midway Ave., FANWOOD, N. J.

M. Shapiro & Sons Constr. Co., 254 W. 54 St., New York, 19, N. Y., CA, **$883,000** garden APARTMENT for 101-families on 6-acre tract at Route 1 and Woodbridge Ave., RARITAN TWP., N. J. Garfield Park Homes, Inc., c/o Kelly & Gruzen, archts., 80 Fifth Ave., New York, 3, N. Y., archts.

▲ **John McShain, Inc.**, 2 W. Franklin St., Baltimore, Md. CA **$1,324,500.** DORMITORY and ALUMNI MEMORIAL HALL, BALTIMORE, MD. John Hopkins University, Homewood St., Baltimore, Md. CD 8/20, under LB.

▲† **John A. Volte Constr. Co.**, 1507 M St. N.W., Wash., D. C., LB, **$1,196,744,** BIOLOGY-GREEN HOUSE BLDG., Howard University, WASH., D. C. General Services Admin., Public Building Service, General Services Bldg., 19 and F Sts. N.W., Wash., D. C. Bids Aug. 28. CD 7/30.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

September 17 Virginia September 18 Kentucky

STREETS AND ROADS

September 17 Virginia September 18 Kentucky

BIDS ASKED—BUILDINGS

▲ **Ky., Louisville**—PLANT—B.A. 9/25—Ford Motor Co., 3000 Schaefer St., Dearborn, Mich., superstructure for assembly plant, Total est. $9,000,000, Albert Kahn Associated Architects & Engineers, Inc., 345 New Center Bldg., Detroit, Mich., engr.-archt. F. A. Fairbrother & Geo. H. Miehl, 345 New Center Bldg., Detroit, Mich., engrs. CD 4/23.

▲ **Va., Norfolk**—HOUSING—B.A. 10/7—Norfolk Redevelopment & Housing Auth., Kresge Bldg., 628 family units, 2 story, masonry Public Housing Projs. VA-6-2 and VA-6-3. $6,500,000. Plans deposit $25. Rudolph, Cooke & Van Leeuwen, Inc., 355 Monticello Arcade, archt. Harrison, Ballard & Allen, 123 E. 77 St., New York, N. Y., engr. CD 9/19/52.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Williams Brothers Co.**, Natl. Bank of Tulsa Bldg., Tulsa, Okla., CA Approx. **$6,000,000.** 152 mi. natural gas pipe line to serve Columbus and Charleston, with connection near Aiken, SOUTH CAROLINA. South Carolina Natural Gas Co., c/o South Carolina Electric & Gas Co., 328 Main St., Columbus, S. C. CD 3/23.

KENTUCKY—Commonwealth of Ky., Dpt. Hys., Frankfort, **Talbott-Myers Constr. Corp. & Talbott-Tobin Contg. Co.**, Winchester, Ky. CA **$871,958.** traffic bound surf. (limestone on grav. base) 14.024 mi. Gilbertsville-Paducah Rd., F 530 (7), SP 79-653, SP 79-393, SP 73-432, Marshall and McCracken Counties. CD 8/31, under LB.

Geo. Eady Co., 340 Byrne St., Louisville, Ky. CA **$800,000.** site development, roads, pavement, parking lots, railroad tracks, inside and outside bldgs., and fencing, LOUISVILLE, KY. Ford Motor Co., 3000 Schaefer St., Dearborn, Mich. Albert Kahn Associated Architects & Engineers, Inc., 345 Center Bldg., Detroit, Mich., engr.-archt. F. A. Fairbrother & George H. Miehl, 345 New Center Bldg., Detroit 2, Mich., engrs. Bids Aug. 11, awarded Aug. 27. CD 6/4/51, under LB.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES

September 22 Ohio

STREETS AND ROADS

September 15, 16 Michigan September 22 Ohio

BIDS ASKED—BUILDINGS

O., Cincinnati—DORMITORY—B.A. 9/16—Xavier University, Dana Ave., 4 story brick, rein.-con. dormitory, Ledgewood Ave. $900,000. Albert V. Waters, Federal Reserve Bank Bldg., archt.-engr. CD 4/2.

SOON LETS CONTRACT—BUILDINGS

▲† **Ind., Mishawaka**—FACTORY—Bendix Products Div. of Bendix Aviation Corp., General Motors Bldg., Detroit, Mich., soon lets contract structural steel for factory for Ninth Naval Dist., Great Lakes, Ill., $2,500,000. A. M. Strauss Inc., Strauss Bldg., Fort Wayne, archt. CD 8/31.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

Miller Thompsen Constr. Co., 23170 Schoenherr Rd., Detroit, Mich. CA **$987,500.** sewage treatment plant, changes to sewage disposal plant, sewage pumping station, incl. grit chamber, tanks, pre-chlorination, FLINT, MICH. City Albert C. Hull, dir. Purchases, Flint, Mich. Bids July 14. CD 7/1.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **W. K. Kerr & Sons**, 525 N. Cassingham Ave., Columbus, O., CA **$1,500,000.** 134-family APARTMENT, 17-acre tract, near atomic plant, PORTSMOUTH, O. Forest Heights Apartments, Portsmouth, O. CD 12/9, under CA.

▲ **Coronet Constr. Co.**, 8836 Brookfield Ave., Brookfield, Ill., Owner Builds. **$1,200,000,** 80 HOMES, BROOKFIELD, ILL.

Priester Constr. Co., 1117 Davenport Bank Bldg., Davenport, Ia., CA, **$900,000,** 25,000 kw TURBO-GENERATOR and high pressure STEAM BOILER, MOLINE, ILL. Iowa-Illinois Gas & Electric Co., 205 Perry St., Davenport, Ia.

▲ **Carl E. Erickson Co.**, 4657 Ravenswood St., Chicago 40, Ill. CA, **$1,500,000,** 165,000 sq. ft. FACTORY, Dundee Rd. near Waukegan Rd., NORTHBROOK, ILL. Barrett Cravens Co. 4613 S. Western Ave., Chicago, Ill. Awarded Aug. 26. CD 7/7.

▲ **Darin & Armstrong, Inc.**, 2041 Fenkel St., Detroit, Mich. CA Est. **$8,000,000.** spring and bumper PLANT, brick, steel, concrete OFFICE, MFG. BLDG., separate power structure, 750,000 sq. ft. floor space, LIVONIA, MICH. Chevrolet Div., General Motors Corp., 3044 W. Grand Blvd., Detroit, Mich. Bids June 30. CD 6/24.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

STREETS AND ROADS

September 18 North Dakota

▲ **Kan., Wichita**—B.A. 9/15—City, City Hall, water treatment plant addns., incl. plant, extens., piping, chemical and services bldg., bins, equip., $3,295,000. Black & Veatch, 4706 Broadway, Kansas City, Mo., engrs. CD 11/11.

BIDS ASKED—BUILDINGS

▲ **Tex., Dallas**—CRIMINAL COURTS, etc.—B.A. 9/24—Dallas Co. c/o Comrs. Court, Court House, criminal courts and jail, 8 story annex, $2,000,000; imprvs., alterations, expansion to Dallas Co. bldgs. incl. 8 story bsmnt., structural steel frame, brick, stone exterior court house, $1,500,000. Plans deposit $50. Smith & Warder, Grand Prairie, Broad & Nelson, N. Ervay St., and Jack Corgan, Melba Bldg., archts. R. H. Clinger, co. engr. CD 11/7.

▲ **Tex., Fort Worth**—STUDENT CENTER—B.A. 9/28—Texas Christian University, c/o Dr. M. E. Sadler, pres., T. C. U. Campus, Fort Worth, student center on

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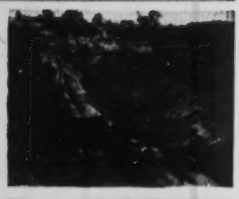
WET JOBS



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In Canada: Construction Equipment Co., Ltd.
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University Campus. $2,000,000. Plans deposit $50. Extended date. Preston M. Geren, 1607 Fort Worth Natl. Bldg., archt. CD 8/31.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Triangle Pipe Line Co.**, 940 Margaret Pl., Shreveport, La., Owner Builds, $25,000,000. 560-mile products pipe line east from Arkansas City, Ark. into Mississippi, Kentucky and Tennessee, to Covington, Ky. ARKANSAS, MISSISSIPPI, TENNESSEE, KENTUCKY.

† **Western Contg. Corp.**, 400 Benson Bldg., Sioux City, Ia. LB $896,289. apron pavement and drainage FY 53 Forbes Air Force Base, Inv. 23-028-54-9, TOPEKA, KAN. U. S. Eng., 601 Davidson Bldg., Kansas City 8, Mo. Bids Aug. 21. CD 8/4.

▲ **TEXAS**—State Hy. Comm., Austin.
John F. Buckner & Sons, P. O. Box 76, Cleburne, Tex. CA $1,140,554, Sulphur River Bridge and approaches, grading, structures, flexible base and surf. 4.07 mi. Hy. SH 80, Pro. C 62-1 and 2-8 and 6, Bowie and Cass Counties. Bids Aug. 19, awarded Aug. 31. CD 8/27, under LB.

▲† **Farnsworth & Chambers**, P.O. Box 74, Houston, Tex. LB $5,051,747, est. $5,900,000, "A", concrete;
Texas Bitulithic Co., N. W. 5th St., Fort Worth, Tex. LB $4,889,677, est. $5,000,000, "B", asph. and concrete for runways, taxiways, aprons, Tye Air Force Base. ENG-41-443-53-65. ABILENE, TEX. U. S. Eng., 100 W. Vicker St., Fort Worth, Tex. CD 8/24, under LB.

BUILDINGS

LOW BIDS AND CONTRACTS

▲ **D'Arcy Leck Constr. Co.**, 2838 Stevens Ave., Minneapolis, Minn. LB $1,588,000. general contract HIGH SCHOOL, 72 St. and Harriet Ave., RICHFIELD (P.O. MINNEAPOLIS), MINN. Bd. Educ., E. C. Ellenson, clk., Richfield, Minn. Bids Aug. 27. CD 7/1.

▲† **Brezina Constr. Co.**, Rapid City, S. D., LB $1,288,279, SCHOOLS, OFFICE and MISC. BLDGS. at Fort Berthold Indian Reservation, Inv. 32-015-54-13, NORTH DAKOTA. U. S. Eng., Fort Lincoln, Box 300, Bismarck, N. D. Bids Aug. 26. CD 6/3.

▲ **D. C. Bass & Sons Constr. Co.**, Bass Bldg., Enid, Okla. CA $1,333,777. general constr.;
Woodhull Plumbing & Heating Co., Manhattan, Kan. CA $608,803. mech. for 5 story, brick, steel, stone, rein.-con. HOSPITAL, FORT SCOTT, KAN. Sisters of Mercy, c/o Sister Mary Xavier, Fort Scott, Kan. CD 7/22, under LB.

▲ **Howard Grubb Development Co.**, Daniel Bldg., Tulsa, Okla. Owner Builds. $7,500,000. 500 DWELLINGS, TULSA, OKLA. D. H. Honn, 106 E. 25 St., Tulsa, Okla., archt.

▲ **Shelby Constr. Co., Inc.**, 4320 Paris Ave., New Orleans, La., Owner Builds. $6,000,000. 17 story OFFICE, HOUSTON, TEX. August Perez & Assoc., Audubon Blvd., New Orleans, La., archts. CD 7/1.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
September 23, 24 California

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Montgomery Electric Co.**, 3275 N. W. Thurman St., Portland, Ore., CA $1,000,000, power sub-station, near Klamath Falls, Josephine Co., OREGON. California-Oregon Power Co., 216 W. Mzin St., Medford, Ore.

CANADA

BIDS ASKED—BUILDINGS

Ont., Toronto—BOILER HOUSE, etc.—B.A. 9/18—Toronto General Hospital, 101 College St., 3 story, bsmt. 123x153 ft., concrete, brick boiler house and 159 ft. radial brick chimney, Wellesley Div., Homewood Pl. $700,000. Allward & Gouinlock, 57 Bloor St. W., archts. CD 10/5/51.

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

▲ **Foundation Co. of Canada Ltd.**, 1900 Sherbrooke St. W., Montreal, Que., CA, $1,538,260 reconstr. wharf Sections 40, 41 and 42, MONTREAL, QUE. National Harbors Bldg., West Block, Ottawa, Ont. CD 8/26, under LB.

ALASKA

HEAVY CONSTRUCTION

LOW BIDS AND CONTRACTS

† **S. Birch & Sons and Lytle & Green**, Securities Bldg., Seattle 1, Wash., CA $546,850. aviation gasoline and jet fuel storage facilities, Inv. 54-8, Elmendorf Air Force Base, ALASKA. U. S. Eng., Anchorage, Alaska, Bids Aug. 12. CD 8/18, under LB.

† **S. Macri Constr. Co.**, Anchorage, Alaska, LB $566,757, est. $581,811, outside utilities for rehabilitation of service to Sunflower Area No. 1, Inv. 54-2, Elmendorf Air Force Base, ALASKA. U. S. Eng., Anchorage, Alaska. Bids Aug. 26. CD 7/28.

(Proposal Advertisements see pp. 160 to 162)

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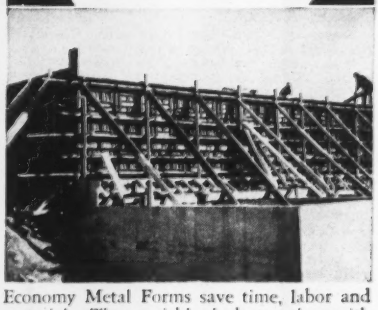

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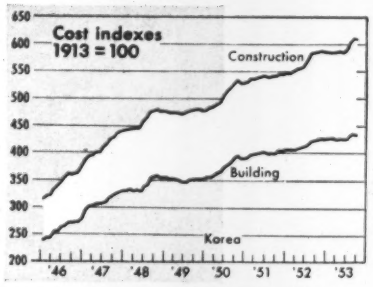
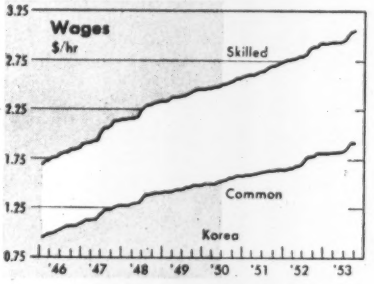
SEPTEMBER CONSTRUCTION SCOREBOARD

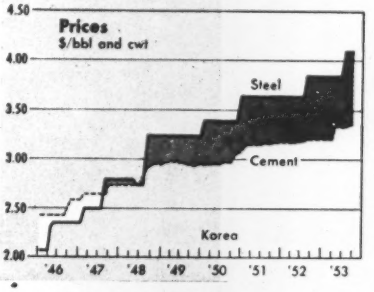


ENR INDEXES (1913 = 100), 20-cities' average	1953 Sept.	% Change from last Month	Year
Construction Cost	610.17	−0.3	+ 4.1
Building Cost	436.24	− 0.2	+ 2.8

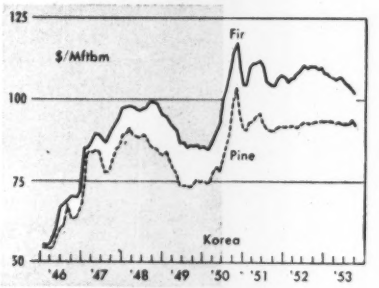


WAGE RATES, 20-cities' average			
Common	$1.921	0.0	+ 6.5
Skilled (aver. 3 trades)	3.075	+ 0.4	+ 5.7
Bricklayers	3.358	+ 0.2	+ 3.7
Structural Ironworkers	3.030	+ 0.3	+ 6.4
Carpenters	2.836	+ 0.7	+ 7.3

MATERIAL PRICES, 20-cities' average			
Cement, bulk, per bbl	$3.349	− 0.1	+ 4.0
Structural Steel, (3-mill aver.), per cwt	4.100	0.0	+ 6.5
Sand, per ton	2.192	+ 0.2	+ 4.0
Lumber, 2x4 Fir, per M. ft. bm	101.736	−1.4	−7.6
Lumber, 2x4 Pine, per M. ft. bm	90.900	− 1.8	− 2.3
Common brick, per M	32.774	+0.04	+ 3.7
Ready-mixed concrete, per c. y	11.935	+ 0.2	+ 6.3
Structural Clay Tile, 3x12x12 per M	159.547	+ 0.1	+ 3.7



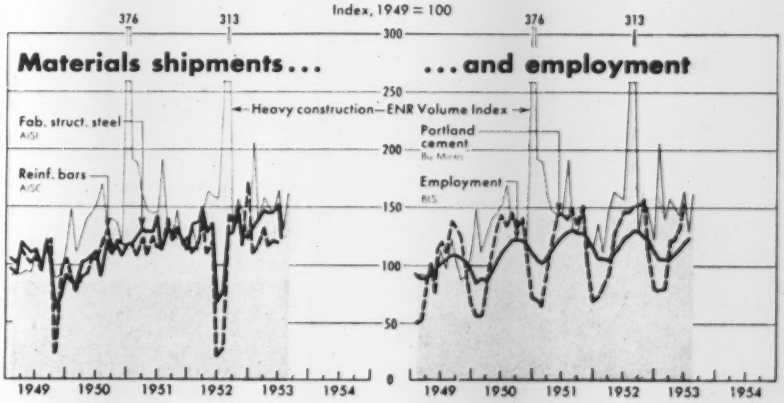
CONTRACTS AWARDED (Millions)	1953 Aug.	8-Mos.	% Change from '52	
Total U. S. (ENR reported)	$1,111.2	10,345.9	−49.7	−8.5
Private	604.7	5,854.8	+20.1	+24.9
Public	506.5	4,491.1	−70.3	−32.1
Federal	92.3	1,065.2	−93.5	−71.5
ENR Volume Index, '13 = 100	487	534	−54.9	−14.8

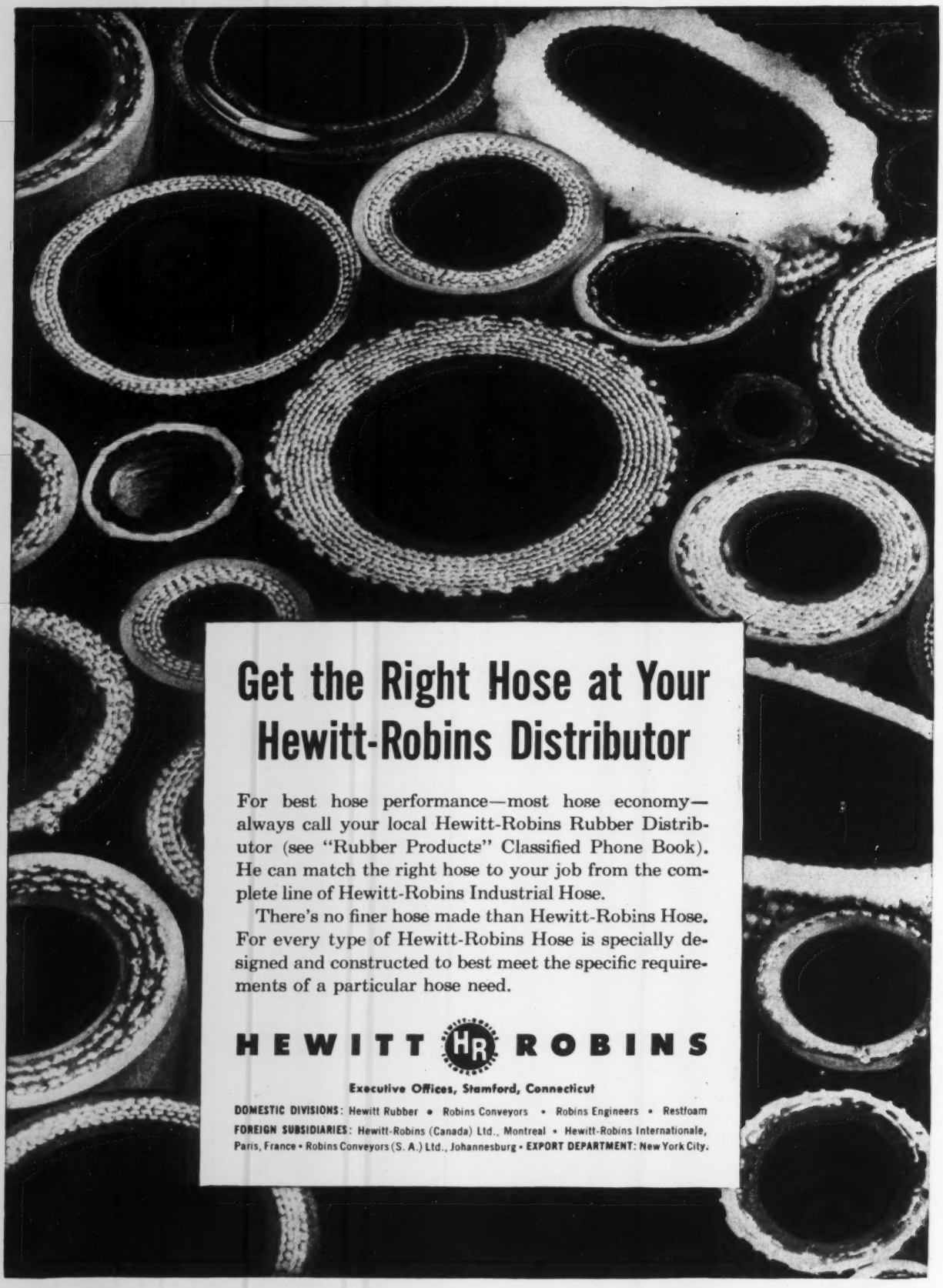


NEW CAPITAL (Millions)				
Total	2,319.1	8,813.0	+422.3	−31.1
State & Municipal Bond Sales	269.0	3,146.5	+65.8	+31.9
Corporate Security Sales	567.6	3,215.6	+267.1	+23.3
Federal (non-federal work)	583.9	855.3	+656.3	+0.3
Federal (federal work)	898.6	1,595.6	+1,697.2	−77.0

MATERIAL SHIPMENTS & LABOR SUPPLIES (Millions)	June (J) July (Ju)	6-Mos. (6) 7-Mos. (7)	% Change from '52 Mo.	Yr.-Cum.
Cement bbls, Bu. of Mines	26.400(J)	118.703(6)	+ 5.3	+ 4.9
Fabr. Struc. Steel, tons AISC	.222(Ju)	1.782(7)	+60.9	+18.9
Lumber, mil. ft. bm., NLMA	3.408(J)	19.628(6)	+12.4	+ 8.2
Lumber Prod., mil. ft. bm., NLMA	3.428(J)	19.316(6)	+ 7.4	+ 6.4
Contract Constr. Employ., BLS	2.676(Ju)	2.436(7)†	− 2.7	− 1.5

† Average





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August awards pick up fast: Private work is booming

According to contract awards reported to ENGINEERING NEWS-RECORD and the Construction Daily, heavy construction picked up sharply in August after its decline in July (ENR Aug. 6, p. 78).

Contracts topped $1.1 billion, averaging $278 million per week. This weekly average is 15% above the July average, and about 10% higher than August, 1952—if you exclude the $1.2-billion Portsmouth, Ohio, atomic plant contract let in that month last year.

This month's awards pushed the total for the first eight months of this year to more than $10.3 billion. That is 7% below contract volume in the similar 1952 period, but only because of the more than $2 billion worth of atomic energy contracts that were awarded last year.

The August gains were all made in private construction and in state and municipal work. Federal contracts are running away behind last year.

Private contract awards totaled $605 million in August. The weekly average was $151 million, 14% higher than the weekly average for July, which was a five-week month. Compared with August, 1952 private awards are up 20%, both as a monthly total and on the weekly average basis.

• **Industrial rises**—Industrial building continued the surge it started in July. The weekly average was $61.9 million in August compared with $34.3 million in the previous month. Because of new pipeline contracts, awards in the private unclassified category were at a high level. Commercial building also held up in August (page 158). The only weak spot was mass housing, where contracts averaged $37.5 million a week. That was a 28% drop from the July weekly average, and 27% below August of last year.

• **Big month**—In state and municipal work, August was a big month for contract awards. The weekly average —$104 million per week—was 19% above the July, 1953 average, and 41% higher than August, 1952. Most categories held up well. Earthwork and waterway contracts were a little lower than in July, as was also the case with highway and sewerage volume.

• **Regions**—If you look at contract awards so far this year on a regional basis, there are three regions where contract volume is running ahead of 1952—New England, Middle Atlantic, and Far West. The increases range from 10% in the Far West to 32% above 1952 in the Middle Atlantic States.

If you leave out last year's big AEC contracts, volume in the South is also 6% ahead of 1952, while in the Middle West there is a 54% increase. The 10% decline in the area between the Mississippi and the Rockies can be accounted for mainly by this year's drop in federal construction. Federal awards in this region total $235 million for the first eight months of this year, a 41% drop below the corresponding period in 1952.

August municipal sales best in three years

State and municipal financing during August totaled $246 million, compared with about $212 million during that month last year, according to the Daily Bond Buyer. That's the biggest volume of local government financing for this normally slow month since 1950, when almost $323 million worth of bonds were sold. The total of municipal issues sold during the first eight months is almost $3.4 billion, compared with $2,985 million during the same period last year. The 1952 eight-month total had set a postwar record.

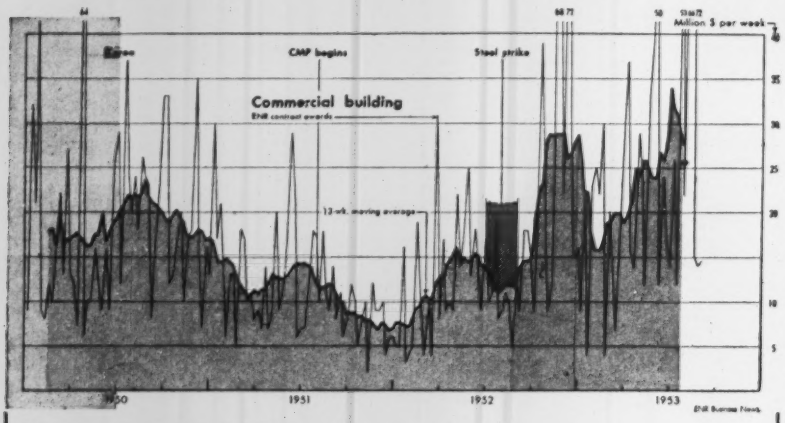
Some of the big issues sold last month were: $32 million of Oregon State Highway bonds; $27 million of Washington gasoline tax revenue bonds; $14,250,000 of North Carolina permanent improvement bonds.

ENGINEERING CONSTRUCTION CONTRACTS—AUGUST 1953

ENGINEERING NEWS-RECORD *reports continental U. S. Construction projects of the following minimum costs—Waterworks, excavation, drainage and irrigation,* $34,000; *other public works,* $60,000; *industrial buildings,* $82,000; *other buildings,* $300,000

Four Weeks—Thousands of Dollars (000 Omitted)

	August, 1953						U. S. Cumulative Eight Months		% Change	Canada August
	New England	Middle Atlantic	South	Mid-West	West of Mississippi	Far West	Total U. S.	1953	1952	'52 to '53	1953
Public Works											
Waterworks	685	12,495	3,676	2,399	5,190	972	25,417	168,837	155,402	+ 8	1,909
Sewerage	1,106	6,283	2,762	9,551	7,138	4,336	31,176	274,438	197,796	+39	1,338
Bridges	2,670	16,713	5,771	44,582	6,403	2,694	78,833	503,939	247,193	+104	694
Earthwork and drainage	347	6,757	1,066		8,840	14,943	31,953	282,291	347,729	−19	3,380
Streets and roads	6,484	23,893	16,921	23,883	31,012	12,036	114,229	1,196,308	1,054,690	+13	5,247
Public buildings, residential	1,492	11,608	11,221			3,524	27,845	312,901	488,951	−36	500
Other public buildings	11,150	30,655	40,998	14,329	18,762	18,503	134,397	1,167,207	3,552,059	−67	15,967
Unclassified	1,670	18,835	11,779	6,775	6,482	17,142	62,683	585,173	571,475	+ 3	2,322
Total public	**25,604**	**127,239**	**94,194**	**101,519**	**83,827**	**74,150**	**506,533**	**4,491,094**	**6,615,295**	**−32**	**31,357**
Federal government (included in above classifications)	1,549	25,546	18,390	1,269	13,971	31,582	92,307	1,065,175	3,732,696	−71	6,190
Private											
Bridges				136			136	7,188	14,520	−50	
Industrial buildings	1,102	29,626	13,121	90,483	43,203	70,131	247,666	1,882,951	1,890,305	− 0.3	22,558
Mass housing	3,710	29,936	17,725	33,672	40,053	25,054	150,150	2,449,645	2,042,604	+20	20,605
Commercial buildings	7,450	23,324	22,655	47,442	13,182	1,905	115,958	840,385	411,094	+104	5,580
Unclassified	810	160	17,694	15,653	41,092	15,361	90,770	674,640	329,972	+104	1,259
Total private	**13,072**	**83,046**	**71,195**	**187,386**	**137,530**	**112,451**	**604,680**	**5,854,809**	**4,688,495**	**+25**	**50,002**
Total Engineering Construction:											
August, 1953—4 weeks	**38,676**	**210,285**	**165,389**	**288,905**	**221,357**	**186,601**	**1,111,213**				**81,359**
July, 1953—5 weeks	56,710	337,365	206,749	270,868	273,459	117,841	1,262,992				94,495
August, 1952—4 weeks	27,423	197,818	206,780	1,456,194	179,609	142,748	2,210,572				57,500
Eight Months—1953	**452,720**	**2,287,855**	**1,865,249**	**2,336,573**	**2,151,074**	**1,252,432**		**10,345,903**		**− 8**	**715,216**
Eight Months—1952	403,753	1,728,572	2,932,676	2,715,324	2,382,322	1,141,143			11,303,790		771,119
% Change '52 to '53	+12	+32	−36	−14	−10	+10					−7



Commercial building keeps going up

The boom in commercial building is playing a major role in keeping private construction rolling along at a high level this year. Contract awards topped $840 million for the first eight months of 1953—104% above 1952. There's plenty of more work coming, too. In the first seven months of this year, $1.2 billion was added to the backlog of commercial building.

Tennessee Gas wins long market battle

Tennessee Gas Transmission Co. is hands-down winner in the two-year-old New England natural gas controversy. And it means about $92 million of new pipeline construction.

The Federal Power Commission last week came through with an order permitting that company to export gas to Canada—thus meeting the pipeline's terms for settling the dispute which snarled gas deliveries to half the New England market last year and threatened to do the same again.

The export permit was the major concession the company demanded in exchange for withdrawing opposition to an earlier FPC decision certifying half the New England market to Algonquin Gas Transmission Co.

Under the settlement which was made final last week by FPC:

- Tennessee G. T. Co. will continue to serve about half the New England market, add several large customers of its lines in the Tennessee-Kentucky area, and export an estimated 115 million cubic feet per day to Canada.
- Algonquin will now complete the final links in its line to serve the remaining half of the New England market.
- FPC gets out from under one of the toughest legal snarls in the history of natural gas pipeline regulation.

• **Tennessee Gas fomented** the dispute in 1951 when it filed to serve the remaining half of the New England market. Earlier it had received an FPC certificate to serve half the market. But FPC ignored the TGT Co. petition, went ahead and certified Algonquin to serve the remaining half.

Then TGT Co. went to court and got the Algonquin certificate set aside—throwing the matter back before FPC. Hearings were started again last fall and lasted till June 4 to decide Algonquin's fate.

Finally in July of this year, Tennessee offered to settle if FPC would grant it a permit to export gas to Canada. It was this permit that FPC granted last week. Earlier in the month it had reaffirmed the Algonquin permit and allowed Tennessee to pick up additional customers along its line up from the Southwest.

• **Under the export permit,** Tennessee proposes to increase its system capacity at an estimated $92 million.

This will mean construction of an additional 900 miles of big transmission line and laterals and an increase of 21,280 hp at compressor stations.

The additional line will be placed:

(1) 570 miles of 20-inch line from Kinder, La. to Portland, Tenn.

(2) 67 miles of loop line in Texas and Louisiana.

(3) 60 miles of loop in Ohio and Pennsylvania.

(4) 45 miles of 20-inch line from Buffalo, N. Y. to a point on the Canadian border near Niagara Falls.

(5) 58 miles of laterals in La.

(6) 100 miles of laterals in Texas.

Fast amortization

It will become a lot harder for industries to obtain

The construction industry can no longer count on the government's "fast amortization" policy for defense plants to stimulate business. Last week in Washington Arthur Flemming, head of the Office of Defense Mobilization, said that ODM was reviewing the expansion goals it set up for 233 industries or products after the start of the Korean war.

So far, only about 75 have been reached—on paper, anyway. At least 40 are less than 7% under way. Now ODM plans to kill at least 150 goals, many of which will be in the incomplete category. For example: freight cars, ore carriers, ocean tankers, and some chemicals. This means an end to tax amortization for companies considering expansion of capacity in these industries.

Review of remaining goals may result in more cuts. Here are other capacity goals far from completion: chemical manufacturing machinery, compressed air cylinders, small gas pipelines, diesel locomotives, mining machinery, plastics, presses and forging equipment, distribution transformers, and hydraulic and steam turbines.

• **Tightening up**—ODM is also tightening up on renewals of the certificates of necessity which authorize fast tax amortization. Construction on certified projects is supposed to start in six months. ODM has been renewing most of the unused certificates. Under the new policy, however, the agency will be renewing very few.

So far, ODM has granted about 18,000 certificates of necessity for about 18,000 new or expanded facilities worth over $27.6 billion. About 61% of this valuation has been eligible for rapid depreciation. It is still receiving an average of 55 new applications weekly for certificates, and is certifying an average of 68.

The report around Washington is that ODM is shelving its uncompleted report on U.S. production potential, which was to spotlight "gaps" in our industrial capacity. The study was supposed to match up projected production and construction levels for various military, defense-supporting, and civilian programs with existing raw material, fabricating, and assembly-plant facilities. Within the last month, work on the study has practically halted. The deadline when it was supposed to be finished has long since passed.

Construction costs drop: May have reached 1953 peak

Construction costs seem to have reached their peak for this year. For, after reaching an all-time high in August, construction costs dipped slightly this month. Lumber prices declined in 10 of the 20 cities covered by ENR's cost indexes. Furthermore, nearly all of the wage contracts scheduled to come up this year already have been negotiated.

During the first nine months, the Construction Cost Index has risen 3.9%, compared with a 7.3% climb during all of 1952. The Building Cost Index has risen by 2.7% this year; during all of 1952 it went up 4.7%.

The ENR Construction Cost Index dropped 0.3% in September below its August level. It now stands at 610.17 (1913=100). The Building Cost Index for September is now 436.24 (1913=100). This is 0.2% below August. A few scattered wage boosts for skilled labor partly offset the drop in lumber prices.

The price cuts in lumber ranged from $1 to $6 per Mftbm for fir 2x4s. Price drops for pine ranged from $1 to $3 per Mftbm, except in Kansas City, where the decrease was $19.50. New York was the only city to report higher prices—up $8 per Mftbm for fir, $5 for pine.

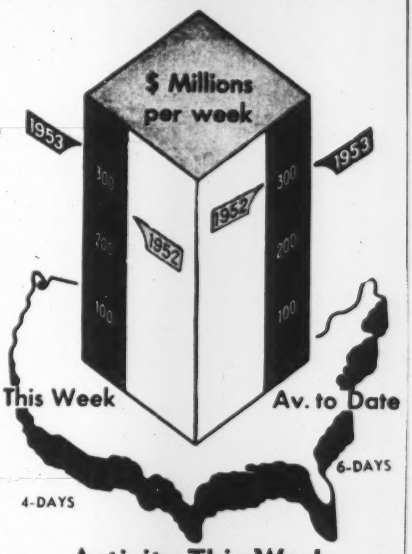
Business Briefs . . .

Another room air-conditioning manufacturer—Emerson Radio & Phonograph Corp., New York, maker of radio and TV sets, has decided to go into room air conditioning. Emerson plans to introduce models early next year, ranging in size from one-third of a ton to one-ton units. A one-and-a-half-ton unit may also be offered.

Postponed—Port of New York Authority has decided to put off indefinitely its sale of $20 million in bonds, scheduled for next week. The reason is that a $125-million issue of New York Thruway bonds is expected to come to market Sept. 15.

Fir plywood price cut—Simpson Logging Co., a major producer, cut mill prices of fir plywood by 5%, in order to meet competition.

Carrier Corp. expansion—Carrier plans to sell about $8½ million of preferred stock to finance new construction. The air conditioning-manufacturer plans to build a Southern plant and make additions to its Syracuse, N. Y., plant.



— Activity This Week —

As reported to ENR, in millions of dollars

Amount of contracts let

	This Week*	Cumulative 37 wks 1953	1952	% chge
Federal	$19.9	$1,117.8	$3,797.2	−71
State and municipal	109.1	3,609.2	3,008.9	+20
Total pub.	129.0	4,727.0	6,806.1	−31
Total priv.	192.0	6,213.4	4,872.2	+28
U. S. total	**$321.0**	**$10,940.4**	**$11,678.3**	**−6**
Contracts by type of work				
Waterworks	$3.6	$175.0	$160.7	+9
Sewerage	7.0	289.2	209.3	+38
Bridges	23.6	542.0	281.5	+93
Highways	55.5	1,284.5	1,107.1	+16
Earthwork, waterways	2.9	296.2	351.4	−16
Buildings:				
Public, excl. hsg.	18.1	1,210.6	3,613.5	−66
Housg., pub.	1.9	315.7	496.1	−36
Housg., priv.	75.7	2,629.2	2,120.1	+24
Commercial	12.2	870.5	438.2	+99
Industrial	56.5	1,978.7	1,946.0	+2
Unclassified	64.0	1,348.8	954.4	+41
Total	**$321.0**	**$10,940.4**	**$11,678.3**	**−6**

* 4-day week

NOTE: Minimum size projects included are: Waterworks and waterway projects, $34,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Week of Sept. 3 1953	Cumulative 36 Wks 1953	% chge '52-53
Corporate securities	$48.7	$3,264.3	+23
State & municipal:			
Excluding housing	40.7	2,974.5	+34
Housing	0.2	212.9	+1
Federal loans, priv. const.	0.4	84.8	−72
Fed. aid, non-fed. const.	...	770.9	+40
Total non-federal	**90.0**	**$7,307.4**	**+23**
Federal approp.:			
In U. S.	...	1,566.7	−77
Outside U. S.	...	28.9	−84
Total new capital	**$90.0**	**$8,903.1**	**−31**

ENR indexes	1953	Base Years = 100 1913	1926	1949
Construction cost	Sept	610.17	293.31	127.91
	Aug	611.87	294.13	128.27
Building cost	Sept	436.24	235.82	124.01
	Aug	437.05	236.26	124.24
Volume	Aug	487	230	163
	Jul	447	182	129

OFFICIAL PROPOSALS

Bids: October 8, 1953

NOTICE TO BIDDERS

Contract C-6
Contract C-7
Contract C-6&7

Sealed propasals will be received by the Ohio Turnpike Commission until 10:00 A. M., Eastern Standard Time, October 8, 1953, for the performance of each of the Contracts enumerated above.

The work covered by Contract C-6 consists generally of the construction of grading, drainage, structures, and paving of approximately 2.9 miles in Construction Section 6 of Ohio Turnpike Project No. 1, beginning at a point about 1,140 feet west of Lintz-Town Line Road at Turnpike Centerline Station 424+30 in Trumbull County and extending eastwardly to a point about 1,480 feet west of the intersection of Gladstone Road and State Route No. 45 at Turnpike Centerline Station 14+00 in Mahoning County.

The work covered by Contract C-7 consists generally of the construction of grading, drainage, structures, and paving of approximately 3.9 miles in Construction Section 7 of Ohio Turnpike Project No. 1, beginning at a point about 110 feet east of the Ravenna-Warren Road at Turnpike Centerline Station 215+00 in Trumbull County, and extending eastwardly to a point about 1,140 feet west of Lintz-Town Line Road at Turnpike Centerline Station 424+30 in Trumbull County, and the construction of an engineer's office building and facilities on or near the site of the work.

The work covered by Contracts C-6&7, which covers a combination of Construction Sections 6 and 7, is the construction as above and elsewhere herein generally described for the individual Construction Sections taken together.

In Construction Section 6, the principal structures to be built are five reinforced concrete box culverts, and two single steel beam bridges of from four to five spans each supported on reinforced concrete abutments and bents. The abutments of these bridges are to be on cast-in-place reinforced concrete piles. The bents of these bridges are to be on spread footings.

In Construction Section 7, the principal structures to be built are three reinforced concrete box culverts, one single bridge, and five twin bridges (each twin bridge consisting of two separate but nearly identical and parallel structures). All of these bridges are steel beam bridges of from one to five spans each supported on reinforced concrete abutments and bents. The abutments of all these bridges are to be on cast-in-place reinforced concrete piles. The bents of two bridges are to be on cast-in-place reinforced concrete piles and the bents of three bridges are to be on spread footings.

Approximate quantities of the major items of construction for Contract C-6 are as follows:

Roadway Excavation	70,000 cubic yards
Borrow	365,000 cubic yards
Structural Concrete	2,700 cubic yards
Reinforcing Steel	400,000 pounds
Fabricated Structural Steel (excluding furnishing and fabrication)	400,000 pounds
Concrete Bearing Piles	1,380 lineal feet
10" Reinforced Concrete Pavement	82,000 square yards

Approximate quantities of the major items of construction for Contract C-7 are as follows:

Roadway Excavation	31,000 cubic yards
Borrow	1,850,000 cubic yards
Structural Concrete	14,000 cubic yards
Reinforcing Steel	1,800,000 pounds
Fabricated Structural Steel (excluding furnishing and fabrication)	2,430,000 pounds
Concrete Bearing Piles	16,000 lineal feet
10" Reinforced Concrete Pavement	110,000 square yards

For each contract, fabricated structural steel and structural expansion and/or contraction joints will be furnished by the Commission.

These Construction Sections have been twice previously advertised. Proposal forms, Plans, Cross Sections and Special Provisions for each of Contracts C-6 and C-7 as formerly advertised are now obsolete. Any person who obtained any of these documents pursuant to the former advertisement and desires to bid for these Con-

OFFICIAL PROPOSALS

struction Sections, or any of them, must obtain a new set of Contract Documents for the letting advertised in this notice, except that he need not obtain a new set of General Specifications or of those Supplemental Specifications already in his possession and applicable to any or all of these contracts, as indicated in the Special Provisions comprising a part of the new Contract Documents.

Copies of the Plans and General Specifications for said Contracts are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

General Specifications for Ohio Turnpike Project No. 1	$ 5.00
Plans (also soil profiles and boring logs), per set, per construction section	15.00
Cross Sections, per set, per construction section	25.00

Forms or copies of all remaining Contract Documents, including Proposals for each of the Contracts set forth above; of the Affidavit which must accompany any such Proposal; of this Notice to Bidders; of the Special Provisions applying to said Contracts; of the Contract to be entered into with the (or each) successful Bidder; and of the Contract Bond to be furnished with such Contract will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office on and after September 10, 1953.

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each Proposal must be accompanied by a certified check or checks on a solvent bank or banks payable to the order of the Ohio Turnpike Commission in an amount not less than $100,000 per Construction Section covered by the Contract on which the Bidder bids. If the Bidder shall tender bids for more than one Contract, said amount shall be not less than $100,000 per Construction Section covered by the Contracts on which he shall tender Proposals; provided, however, that if one or more Construction Sections are included in more than one Contract for which the Bidder shall tender Proposals, the Bidder need furnish only $100,000 for each such section, notwithstanding such duplication. The Commission may at any time cash any such check. Each such check or the proceeds thereof will be held by the Commission as a guaranty that, if any Proposal guaranteed thereby is accepted a contract will be entered into and the performance of the Proposal secured.

Each such check or the proceeds thereof will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications, provided that if there be a forfeiture, it shall be in an amount equal to $100,000 per Construction Section covered by the Proposal with respect to which the forfeiture occurs, and any excess will be returned to the Bidder.

All bids must be received at or before 10:00 A. M., Eastern Standard Time, October 8, 1953, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where all Proposals will be publicly opened and read.

The award of any of the above-enumerated Contracts, if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION

Bids: October 8, 1953

NOTICE TO BIDDERS
Contract C-28
Contract C-29
Contract C-28&29

Sealed proposals will be received by the Ohio Turnpike Commission until 10:00 A. M., Eastern Standard Time, October 8, 1953, for the performance of each of the Contracts enumerated above.

The work covered by Contract C-28 consists generally of the construction of grading, drainage, structures, and paving of approximately 3.8 miles in Construction Section 28 of Ohio Turnpike Project No. 1, beginning at a point about 1500 feet east of Chapin Road at Turnpike Centerline Station 919+40.93 in Erie County, and extending eastwardly to a point about 500 feet east of the Township line between Berlin and Florence Townships at Turnpike Centerline Station 1121+50 in Erie County, and the construction of engineer's office buildings and facilities on or near the site of the work.

The work covered by Contract C-29 consists generally of the construction of grading, drainage, structures, and paving of approximately 3.8 miles in Construction Section 29 of Ohio Turnpike Project No. 1, beginning at a point about 300 feet east of the Huron River at Turnpike Centerline Station 720+48 in Erie County, and extending eastwardly to a point about 1500 feet east of Chapin Road at Turnpike Centerline Station 919+40.93 in Erie County, and the construction of engineer's office buildings and facilities on or near the site of the work.

The work covered by Contract 28&29, which covers a combination of Construction Sections 28 and 29, is the construction as above generally described for the individual Construction Sections taken together.

In Construction Section 28, the principal structures to be built are five reinforced concrete box culverts, one single bridge, and three twin bridges (each twin bridge consisting of two separate but nearly identical and parallel structures). All of these bridges are steel beam bridges of from one to four spans each supported on reinforced concrete abutments and bents. The abutments of three bridges are to be on steel piles, and the abutments of one bridge are to be on rock. The bents of two bridges are to be on steel piles, and the bents of one bridge are to be on spread footings.

In Construction Section 29, the principal structures to be built are six reinforced concrete box culverts and four single bridges. All of these bridges are steel beam bridges of four spans each supported on reinforced concrete abutments and bents. The abutments and bents of all of these bridges are to be on cast-in-place reinforced concrete piles.

Approximate quantities of the major items of construction for Contract C-28 are as follows:

Roadway Excavation	711,000 cubic yards
Borrow	331,000 cubic yards
Structural Concrete	6,950 cubic yards
Reinforcing Steel	960,000 pounds
Fabricated Structural Steel (excluding furnishing and fabrication)	510,000 pounds
Steel Piling	9,000 lineal feet
10" Reinforced Concrete Pavement	104,000 square yards

Approximate quantities of the major items of construction for Contract C-29 are as follows:

Roadway Excavation	595,000 cubic yards
Borrow	87,000 cubic yards
Structural Concrete	6,000 cubic yards
Reinforcing Steel	845,000 pounds
Fabricated Structural Steel (excluding furnishing and fabrication	580,000 pounds
Cast-in-Place Piles	11,700 lineal feet
10" Reinforced Concrete Pavement	106,000 square yards

For each contract, fabricated structural steel and structural expansion and/or contraction joints will be furnished by the Commission.

This is a readvertisement of the work to be done on each of these Construction Sections. Proposal forms, Plans, Cross Sections, and Special Provisions for Construction Sections, and Special Provisions for Construction Sections 28 and 29 as formerly advertised are now obsolete. Any person who obtained any of these documents pursuant to the former advertisement and desires to bid for said Construction Sections must obtain a new set of Contract Documents for the letting advertised in this notice, except that he need not obtain a new set of General Specifications or of those Supplemental Specifications already in his possession and applicable to any or all of these Contracts, as set forth in the Special Provisions comprising a part of the new Contract Documents.

Copies of the Plans and General Specifications for said Contracts are immediately available for public inspection or purchase at the office of the Chief Engineer, Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. These documents may be purchased from said Chief Engineer for the following sums, per set, which sums are non-returnable:

General Specifications for Ohio Turnpike Project No. 1	$ 5.00
Plans (also soil profiles and boring logs), per set, per construction section	15.00
Cross Sections, per set, per construction section	25.00

Forms or copies of all remaining Contract Documents, including Proposals for each of the Contracts set forth above, of the Affidavit which must accompany any such Proposals, of this Notice to Bidders, of the Special Provisions applying to said Contracts, of the Contract to be entered into with the (or each) successful Bidder, and of the Contract Bond to be furnished with such Contract will be furnished upon request and without charge to any interested person at the aforesaid Chief Engineer's office, on and after September 10, 1953.

All Proposals must be on the form prescribed by the Commission and must comply with the terms and conditions set forth in the Contract Documents.

Each Proposal must be accompanied by a certified check or checks on a solvent bank or banks, payable to the order of the Ohio Turnpike Commission in an amount not less than $100,000 per Construction Section covered by the Contract on which the Bidder bids. If the Bidder shall tender bids for more than one Contract, said amount shall be not less than $100,000 per Construction Section covered by the Contracts on which he shall tender Proposals; provided, however, that if one or more Construction Sections are included in more than one Contract for which the Bidder shall tender Proposals, the Bidder need furnish only $100,000 per each such section, notwithstanding such duplication. The Commission may at any time cash any such check. Each such check or the proceeds thereof will be held by the Commission as a guaranty that, if any Proposal guaranteed thereby is accepted, a Contract will be entered into and the performance of the Proposal secured.

Each such check or the proceeds thereof will be returned or forfeited as provided in paragraphs G-3.03 and G-3.06 of the aforesaid General Specifications, provided that if there be a forfeiture, it shall be of an amount equal to $100,000 per Construction Section covered by the Proposal with respect to which the forfeiture occurs, and any excess will be returned to the Bidder.

All bids must be received at or before 10:00 A. M., Eastern Standard Time, October 8, 1953, in the offices of the Ohio Turnpike Commission, 139 East Gay Street, Columbus 15, Ohio. At said hour, the bid box will be removed to the Neil House Hotel, 41 South High Street, Columbus, Ohio, where all Proposals will be publicly opened and read.

The award of any of the above-enumerated Contracts, if any award be made, will be to the Bidder or Bidders whose Proposal or combination of Proposals is lowest and best for the performance of the work, taken as a whole, and complies with all the prescribed requirements. The Commission reserves the right to reject any or all Proposals and to waive technicalities.

OHIO TURNPIKE COMMISSION

Bids: September 25, 1953

Tuscarawas Avenue Viaduct

LEGAL NOTICE

Sealed proposals will be received at the office of the Director of Public Service, City Building, Barberton, Ohio, until 12:00 o'clock noon, (Daylight Saving Time) on September 25, 1953, by virtue of Resolution No. 70-1953 passed August 3, 1953, for all labor and materials necessary for the erection, construction and completion of the Widening of the Tuscarawas Avenue Viaduct located on Tuscarawas Avenue between the bridge over the Akron-Barberton Belt Railroad and the bridge over the Pennsylvania and Baltimore & Ohio Railroads, Barberton, Ohio, according to the plans and specifications prepared by F. W. Stafford, Engineer, 888 Home Avenue, Akron, Ohio.

Plans and specifications and blank proposals for this work are on file at the office of the Director of Public Service, City Building, Barberton, Ohio, and at the office of the Engineer, 888 Home Avenue, Akron, Ohio. Copies of said plans, specifications and blank proposals may be obtained at the office of the Director of Public Service upon the deposit of fifteen dollars ($15.00), which deposit will be refunded upon their return in good order, if returned within ten days after award of contract.

Proposals shall be made in conformity with the General Code of the State of Ohio on the printed forms provided therefor, as none other will be accepted.

OFFICIAL PROPOSALS

Each proposal must contain the full name of the party or parties making the same and all persons interested therein, and must be accompanied by a certified check on a solvent bank in a sum equal to five (5) percent of the amount of the bid, payable to the order of the Director of Public Service; or a Guarantee Bid Bond in an amount equal to ten (10) percent of the bid may be furnished in lieu of the certified check; such bond or check shall be a guarantee that, if such proposal is accepted, the bidder will enter into a contract and properly secure the performance thereof by a Guarantee Bond of an accepted Surety Company in the amount of one hundred (100) percent of the bid price, within ten (10) days after written notification of the acceptance of the proposal.

Proposals will be received on all labor, plant and materials required to perform the work in accordance with the plans and specifications.

The Director of Public Service reserves the right to reject any and all bids; to waive any informality in any proposal; and to hold all bids for thirty (30) days pending final action thereon.

by order of the Director of
Public Service
Walter Tholt

Bids: September 24, 1953

PROTECTIVE COATING—EXTERIOR WALLS BUILDING NO. 55—PUMP HOUSE—NEWARK AIRPORT, NEWARK, NEW JERSEY

THE PORT OF NEW YORK AUTHORITY
CONTRACT O & M-171
PROPOSAL NO. 226

Sealed proposals for furnishing all labor, material and equipment to apply protective coating on exterior walls of certain sections and pump house, Building No. 55, Newark Airport, Newark, N. J., will be received at the office of the Director of Purchase of The Port of New York Authority, Room 900, 111 8th Ave., New York 11, until 11:00 A.M. (E.D.S.T.) Thursday, September 24, 1953, at which time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Department of Purchase and Administrative Services, Room 900, and copies will be furnished upon deposit of $10.00 per set. Deposit must be delivered to Treasury Department, Room 1001, where receipt in duplicate will be issued. The duplicate copy of the receipt is then to be delivered to the Department of Purchase and Administrative Services, where you will be furnished with the contract documents. The deposit will be remitted if the documents are returned in good condition, not later than thirty days after the opening of proposals. The deposit will be forfeited if the documents are not returned within thirty days.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

U. S. Government

ADVERTISEMENT—Sealed Bids will be received in the Office of the Engineering and Construction Director, Panama Canal Company, Balboa Heights, Canal Zone, until 10:00 A.M. EST, October 27, 1953 at which time they will be formally opened, for furnishing all plant, tools, equipment, materials, labor and services and for performing all work for construction of 33 masonry type houses (66 apartments) at Diablo Heights, Canal Zone. Work includes site preparation, excavation, paving of streets, construction of sewers, street lighting system, 33 buildings, and all electrical and plumbing work. Project to be completed 255 calendar days after award. Copies of plans and specifications may be obtained from Panama Canal Company, 24 State Street, New York 4, N. Y. Requests should be accompanied by a $40.00 deposit for each set. Deposit should be in the form of a U.S. money order or a certified check made payable to "Treasurer, Panama Canal Company." Plans and specifications may be inspected at the following places: Panama Canal Company, 101 Indiana Ave., N. W., Washington 25, D. C.; Panama Canal Company, 24 State Street, New York 4, New York; Office of the District Engineer, U. S. Engineer's Office, 1709 Jackson Street, Omaha 2, Nebraska; Office of the District Engineer, U. S. Engineer's Office, 180 New Montgomery Street, San Francisco 19, California; Office of the District Engineer, U. S. Engineer's Office, Foot of Prytania Street, New Orleans, Louisiana; Office of the District Engineer, U. S. Engineer's Office, 751 S. Figueroa Street, Los Angeles, California; Office of the Division Engineer, U. S. Engineer's Office, Southwestern Division, 1114 Commerce Street, Dallas, Texas; Office of the District Engineer, U. S. Engineer's Office, 4735 Marginal Way, Seattle 4, Washington; Office of the District Engineer, U. S. Engineer's Office, P. O. Box 1538, Albuquerque, New Mexico.

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4035) will be received at Maxwell, Nex Mexico, until October 15, 1953, for furnishing labor and materials for earthwork and structures for rehabilitation of Vermejo Diversion Dam, Vermejo Canal and Eagle Tail Canal, Vermejo Project. Location: Near Maxwell, New Mexico. Principal items are: 277,500 cu. yds. excavation for diversion dam alterations, canals and structures; 1,300 cu. yds. concrete; 720 lin. ft. placing rubber water stops; lump sum, furnishing and installing four radial gates and hoists; 17,000 lbs. furnishing and installing metal slide gates; and other work. Completion time 640 days. For particulars, address Bureau of Reclamation, Maxwell, New Mexico; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4031) will be received at Friant, California, until October 7, 1953, for furnishing labor and materials for earthwork and structures, Sta. 2+19 to Sta. 756+00, Lateral 24.2, Unit 3, Madera Distribution System, Central Valley Project, Calif. Location: Near Madera, California. Principal items are: 244,000 cu. yds. excavation; placing and compacting 25,000 cu. yds. earth lining in lateral; 640 cu. yds. concrete in structures; 3,300 lin. ft. 18-inch to 69-inch precast concrete pipe; 115,000 lbs. steel sheet piling; and other work. Completion time 180 days. For particulars, address Bureau of Reclamation, Friant, California; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-4030) will be received at Ephrata, Washington, until October 6, 1953, for furnishing labor and materials for earthwork, pipe lines, and structures, Eltopia Branch canal and North Part Unit P-9, laterals, sublaterals, and wasteways, Potholes East canal laterals, Columbia Basin Project, Washington. Location is west of Eltopia, Washington. Principal items are: 1,200,000 cu. yds. excavation and other earthwork; 2,260 cu. yds. concrete; 14,800 lin. ft. concrete pipe, 12-inch to 48-inch; various gates, weirs, and metalwork; 4 pumping plants with miscellaneous items; and other work. Completion time 400 days. For particulars, address Bureau of Reclamation, Ephrata, Washington; or Building 53, Denver Federal Center, Denver, Colorado.

W. A. DEXHEIMER, Commissioner

GOV. OF DIST. OF COL., DIR OF SAN'Y ENG'G, Sept. 2, 1953. SEALED PROPOSALS will be recd. in Rm. 404, 499 Pa. Ave., N.W., Wash. 1, D. C., until 2 PM, DST, September 23, 1953, and then publicly opened and read for constr. Trunk Watermain, MacArthur Boulevard, N.W., bet Macomb St. and Reservoir Rd., consisting of approx. 7,100 lin. ft. of 31.5" dia. steel watermain, and 487 lin. ft. of 18.0" dia. steel watermain. Proposal forms and specns. obtainable, without charge, from Supervisor, Contr. Sec., Procurement Office, D. C., Room 406, 499 Pa. Ave., N.W. (Tel. NA 8-6000, Ext. 2378.)

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OFFICIAL PROPOSALS

Bids: September 17, 1953

New York State Road Work

NOTICE TO CONTRACTORS: STATE DEPARTMENT OF PUBLIC WORKS, ALBANY, N. Y.,—Pursuant to the provisions of the Highway Law, and Article 2, Title 9 of the Public Authorities Law, and special provisions for projects financed with Federal Aid funds, sealed proposals will be received until ten-thirty o'clock A.M., advanced standard time, which is nine-thirty o'clock A.M., eastern standard time, on the 17th day of September, 1953, by Henry A. Cohen, Director, Bureau of Contracts and Accounts, 14th Floor, The Governor Alfred E. Smith State Office Building, Albany, N. Y., for the following projects:

County	Contract No.	Name	Miles	Type	Deposit	Estimated Cost of Work
		DISTRICT No. 1 G. L. NICKERSON, District Engineer, 352 Broadway, Albany, N. Y.				
		DISTRICT No. 2 L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica, New York				
		DISTRICT No. 3 WILLIAM ROBINSON, District Engineer, 301 E. Water Street, Syracuse, N. Y.				
		DISTRICT No. 4 E. G. H. YOUNGMANN, District Engineer, Barge Canal Terminal, Rochester 1, N. Y.				
		DISTRICT No. 5 C. R. WATERS, District Engineer, 65 Court Street, Buffalo, N. Y.				
		DISTRICT No. 8 J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.				
Albany, Greene, Schen. Herk., Mad. Mont., Oneida, Cay., Onon. Seneca, Gen., Monroe, Ont., Erie, Oran. Rock., Ulster, West.	T.T.B.53-1	New York State Thruway-Hudson-Catskill-Mohawk & Ontario Sects. Toll Plaza Booths		Fabricate, Deliver & Erect 117 Toll Booths	$35,000 Plans $25	$680,000
		DISTRICT No. 2 L. KETCHUM, District Engineer, 109 No. Genesee Street, Utica, New York				
Herkimer	RC 53-116	Mohawk Village, S.H. 5170-CA (Br. No. 1)		Painting 1 bridge	$600 Plans $10	11,000
		DISTRICT No. 3 WILLIAM ROBINSON, District Engineer, 301 E. Water Street, Syracuse, N. Y.				
Onondaga	FAC 53-18	Syracuse City: Adams Street Project U-446(4)	0.35	Asp. Conc. Ty. 2A = 0.31 Mi. Misc. Work. = 0.04 Mi.	$12,000 Plans $10	202,000
Onondaga	FAS8 53-14	De Witt-Cicero (Thompson Rd.) Co. Rd. 13 Project S-403(1)	0.98	Asp. Conc. Ty. 2A = 0.978 Mi. Misc. Work = 0.002 Mi.	$14,000 Plans $10	246,000
		DISTRICT No. 7 R. W. SWEET, District Engineer, 444 Van Duzee St., Watertown, New York				
Franklin	FARC 53-112	Malone-Moira Pt. 2, SH 5031 Project F-582(1)	0.14	Asp. Conc. Ty. 1A, Opt. = 0.11 Mi. Misc. Work = 0.03 Mi.	$2,500 Plans $10	48,000
		DISTRICT No. 8 J. S. BIXBY, District Engineer, Pleasant Valley Road, Poughkeepsie, N. Y.				
Rockland	HT 53-9 RC 53-118 ST 53-32	New York State Thruway-Hudson Sect.-Sub. 8 (Suffern-Nyack Pt. 3); Palisades Interstate Pkwy. Interchange.; 8 Misc. Sec. Rds.; Coyles Corners-Short Clove, SH 9005	4.82 (Acc.) 4.52 (Thy.)	9" Cem. Conc. Pavt. 2@25' Var. Wide = 4.79 Mi.; 8" Unreinf. Cem. Conc. Pavt. Var. Wide = 2.42 Mi. Asp. Conc. Ty. 1A, Opt. = 0.73 Mi. Grad. & Misc. Work = 1.04 Mi. N.Y.RR Relocation = 0.36 Mi. 7 Hy. Sepa. Comp. I-Beams 47', 218.8', 258.7', 259.6', 48.5', 90' & 251.4', 1 Br. Comp. I-Beam 62' 1 R.R.Sep. Comp. I-Beam 210'	$400,000 Plans $100	$7,449,000
Rockland	CT 53-12 RC 53-117 ST 53-31	New York State Thruway—Catskill Sect.-Sub. 7 (Suffern - Harriman Pt. 2); Rte. 17 Interchange; 4 Misc. Sec. Rds.; New Jersey State Line-Ramapo SH 1844	5.62 (Acc.) 1.89 (Thy.)	9" Cem. Conc. Pavt. 2@25' Var. Wide = 4.64 Mi.; 9" Unreinf. Cem. Conc. Pavt. Var. Wide = 2.56 Mi. Asp. Conc. Ty. 1A, Opt. = 0.23 Mi. Misc. Work, 0.08 Mi. 4 Hy. Seps. Comp. I-Beams 161.1', 58', 218.8' & 125' Hy. Sep. I-Beam 246.8', Br. Built-up Beam 462.5 R.R. & Hy. Sep. Div. Comp. I-Beam 788', Ped. Br. Comp. I-Beam 149.5'	$550,000 Plans $100	10,046,000
Rockland	HT 53-10 RC 53-121 ST 53-33	New York State Thruway-Hudson Sect., Sub. 9A (Nyack Approach to Tappan Zee Bridge); Nyack Interchange; Access Ramps; New Jersey State Line — Nyack Pt. 3 & Pt. 4, SH 8136-5682; Nyack Village: Main St., SH 8459; Knapps Corners-Nyack, SH 5178 & Nine Misc. Secondary Cross Roads Including Relocation of Railroad Tracks	4.60 (Acc.) 1.57 (Thy.)	9" Cem. Conc. Pavt. 2 @ 37' Var. Wide = 1.57 Mi.; 9" Unreinf. Cem. Conc. Pavt. Var. Wide = 3.21 Mi. Asp. Conc. Ty. 1A, Opt. = 0.78 Mi. Relocation of Erie RR = 0.56 Mi. Misc. Work = 0.05 Mi. 6 Hy. Seps. Comp. I-Beams 227.2' 60.2', 180.8', 215.8', 180.3' & 290.8'; R.R. Sep. Comp. I-Beam Thru. Gird. 286.3'	$400,000 Plans $100	7,765,000
Westchester	SMRP 53-2 RC 53-119	Sawmill River Parkway (Mt. Kisco-Katonah Pt. 2); Harris Road Interchange; Railroad Ave. Access Rd.; Mt. Kisco-Katonah, SH 1533	0.51 (Acc.) 2.68 (Rd.)	9" Cem. Conc. Pavt. 2 @ 24' Var. Wide = 2.81 Mi.; Asp. Conc. Ty. 1A, Opt. = 0.38 Mi. R. R. Sep. Plate Girder 130', Hy.Sep. Comp. I-Beam 71' Br.I-Beam 57.1'	$150,000 Plans $50	2,527,000
		DISTRICT No. 10 M. E. GOUL, District Engineer, Montauk Highway, Babylon, L. I., New York				
Nassau-Suffolk	RC 53-115	Hempstead-Farmingdale, Pt. 1, SH 1799 Babylon-Bayshore, SH 743; Bayshore-Brookhaven Town Line, SH 5301	2.29	White Traffic Line Markers	$700 Plans $10	13,000

Maps, plans, specifications and proposal forms may be seen and obtained at the office of the State Department of Public Works, Bureau of Contracts and Accounts, Albany, N. Y., and at the office of the District Engineers noted above, and may also be seen at the office of the State Department of Public Works, 270 Broadway, New York City.

The deposit for Plans and Proposal Forms for each contract is indicated above. A refund will be made in full to bidders for return of one set, in good condition, within 30 days of award, or rejection of bids; refund for all other sets in good condition, similar period, will be 50% of deposit.

Special attention of bidders is called to "General Information for Bidders" in the proposal, specification, and contract agreement, and to the special provisions applying to projects financed with federal funds. Award of a contract is subject to the "Controlled Materials Plan" of the National Production Authority as well as to regulations issued thereunder.

Proposal for each contract must be submitted in a separate sealed envelope with the name and number of the contract plainly endorsed on the outside of the envelope. Each proposal must be accompanied by draft or certified check payable to the order of the "State of New York, Commissioner of Taxation and Finance" for the sum as specified in the advertisement and the proposal. The retention and disposal of the bidding check, the execution of the contract and bonds shall conform to the provisions of the Highway Law, as set forth in "Instructions to Bidders."

When optional types are permitted on contracts with federal funds, bidders must state in the space provided in the proposal the exact designation of the optional type upon which the proposal is predicated.

The right is reserved to reject any or all bids.

B. D. TALLAMY
SUPT. OF PUBLIC WORKS

INSURE COMPETITION

and get the lowest possible bid for your proposed work by placing your bids wanted advertising in this Section.

Don't limit competition to local bidding alone. Bring it to the attention of contractors the country over. They read this Section every week—make sure your bid is here where they can read it.

OFFICIAL PROPOSALS

Commonwealth of Puerto Rico, PUERTO RICO WATER RESOURCES AUTHORITY, SAN JUAN, PUERTO RICO. Sealed proposals (Invitation No. C-28297) will be received at San Juan, Puerto Rico until October 9, 1953 for furnishing 1528 feet of 8'-6" diam. welded plate steel pipe liner consisting of approximately 134 tons of welded mild steel pipe (forty-five 16-foot pipe sections) and approximately 457 tons of welded low-alloy steel pipe (fifty 16-foot pipe sections including one reducing elbow, and one 4'-6" diam. pipe section 8 feet long) for installation at the Guayo-Prieto-Yauco Tunnel of the Southwestern Puerto Rico Project. Time of delivery is important and deliveries FAS the seaboard terminal for shipment to Puerto Rico, shall start not later than March 1, 1954. Deliveries shall be at a rate equivalent to not less than 4 pipe sections per week. Complete delivery FAS the seaboard terminal is desired within 180 calendar days after March 1, 1954. Plans, Specifications, and Contract Documents may be obtained at the Office of the Purchasing Officer, Puerto Rico Water Resources Authority, San Juan, Puerto Rico.

Bids: September 22, 1953

Contract No. 32, 32A, 32B, 32C

Contract No. 32 comprises the paving, drainage and miscellaneous construction of approximately nineteen and seven tenths (19.7) miles of Turnpike between Mile 68.3 (Station 1463+14) at the Standard Tunnel, near the town of Standard, Kanawha County, and Mile 88.0 (Station 89+12, Ramp F) Charleston, Kanawha County, West Virginia. Included in Contract No. 32 are the Chelyan, Kanawha City and Charleston Interchanges.

Contract No. 32 consists of the combined quantities of Contract No. 32A, 32B, and 32C.

The Principal Items of Work Include:

	Approximate Quantities			
	32A	32B	32C	
Alternate No. 1 (Rigid Pavement)				
Select Subbase	238,000	210,000	240,000	Tons
Portland Cement Concrete	130,000	107,000	132,000	Sq. Yds
Macadam Base Aggregate	6,000	5,000	4,000	Tons
Emulsified Asphalt	182,000	139,000	132,000	Gals.
Alternate No. 2 (Flexible Pavement)				
Select Subbase	236,000	208,000	238,000	Tons
Macadam Base Aggregate	51,000	41,000	50,000	Tons
Asphaltic Concrete Binder Course	14,000	12,000	15,000	Tons
Asphaltic Concrete Wearing Course	7,000	6,000	7,000	Tons
Emulsified Asphalt	888,000	719,000	848,000	Gals.
Other Items (Included in Both Alternates)				
Culvert Pipe and Storm Sewer	3,500	3,000	4,000	L. F.
Underdrains	7,500	12,500	6,000	L. F.
Toll Plazas	0	1	2	each

Proposals will be received at the office of the West Virginia Turnpike Commissoin, 1340 Wilson Street, Charleston 5, West Virginia until 9:00 A.M. Eastern Standard Time, and thereafter at the House of Delegates Chamber, State Capitol, Charleston, West Virginia until 10:00 A.M. Eastern Standard Time, on September 22, 1953, at which time and place said proposals will be publicly opened and read.

WEST VIRGINIA TURNPIKE COMMISSION
D. H. Morton, Chairman

August 24, 1953

OFFICIAL PROPOSAL

RATE: The rate for Official Proposal Advertising is $1.50 per line (or fraction) per insertion.

COPY RECEIVED: up to 10:30 A.M. Friday for issue out following Thursday subject to space open for last minute ads.

SEND COPY: to Official Proposal Division, Engineering News-Record, 330 W. 42nd St., New York 36, N. Y.

EMPLOYMENT

SALES MANAGER

Well known machinery manufacturer offers unusual opportunity if your experience includes improving and developing a field sales force and distributor organization in the Construction Equipment field. Send full particulars covering education, experience, etc. to

P-9046, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (36)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

VALUATION ENGINEER—Wanted by large corporation operating nationally, for establishing and maintaining insurable values of its various plants. Permanent staff position. Location Northeastern Ohio. Salary open. Reply P-8749, Engineering News-Record.

WANTED: MAN for engineering promotion in eastern paving field, college graduate preferably with state highway experience, who likes competitive effort. Good salary and opportunity for promotion. Write full details. P-9056, Engineering News-Record.

UNUSUAL OPPORTUNITY—Building Construction Sales Engineer. To contact industrial firms for design and construction with engineering or architectural background. Fine opportunity for advancement if capable. P-9042, Engineering News-Record.

WANTED EXPERIENCED party chiefs C.E. for New York State Thruway field layout work; also transitmen. P-9017, Engineering News-Record.

ENGINEER WITH training and experience in Sanitary field. Excellent opportunities in United States or Latin America with small but long established firm having Profit Sharing Plan. P-9030, Engineering News-Record.

EXPERIENCED CHECKERS wanted for work on structural and miscellaneous steel. In application give experience record, salary requirements and date available for work. Carolina Steel & Iron Co., Greensboro, N. C.

WANTED—SEWER Foreman. Experienced, long term job. Newark, N. J. area. Reply to P-9106, Engineering News-Record.

GENERAL CONSTRUCTION Superintendent for Williamsburg Restoration Inc. Ages 35 to 50. Permanent. No travel. Graduate of recognized technical school in degree of Civil, Architectural, or Structural Engineer or equivalent thereto. Employment record should consist of minimum 5 years office and 10 years as Construction Superintendent for general contractors. Experience must consist of high type, such as office building, banks, hotels etc. Applicants write (J. A. Fuller, Director of Employment Colonial Williamsburg, Williamsburg, Virginia)

EXPERIENCED ESTIMATOR and Chief Engineer between the ages of 35 and 45, to make quantity take-offs, help price, buy, expedite and do some field supervision. All our work is competitive. We specialize in industrial, commercial and public works. Only experienced and high-grade men need apply. Permanent job for right man. Excellent salary and bonus. Office located in Ohio. Send qualifications, experience and photograph if available. P-9112, Engineering News-Record.

WANTED: STEEL erection superintendent for structural and reinforcing steel jobs, including bridges. Salary commensurate with ability. Must furnish references. Halloran Construction Co., 1 Washington Avenue, Providence, R. I.

REFUSE DISPOSAL Engineer $8520-$10,700 per year. The City of Philadelphia has an opening for a mechanical engineer with 7 years experience to direct all activities of the refuse disposal division of the Department of Streets. Opportunity for professional advancement and for the development of one of the largest incineration plant expansion programs in the country. For further information, Apply Personnel Department, Room 201, City Hall, Philadelphia.

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(Continued on the following page)

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P-8817, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Blount Brothers Construction Company
Post Office Box 1144
MONTGOMERY, ALABAMA

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Salary Commensurate with experience.

Darbyshire Steel Co., Inc.
P. O. Box 352 **El Paso, Texas**

WANTED

EXPERIENCED CHIEF ESTIMATOR

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P-9050, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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CLEVELAND 1. OHIO

CHIEF MECHANICAL INSPECTOR

Mechanical Engineer preferred, with broad background in mechanical installation and operation. Must have responsible experience as Inspector of mechanical installations on large industrial projects. Central station steam power plant experience desirable.

Bechtel Corporation
220 Bush Street San Francisco, California

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Men with experience in construction machinery field, interested in position as salesmen for one of the country's leading construction machinery distributors for sale of roadbuilding and construction machinery and equipment. When applying give full particulars as to experience, references, and other pertinent information.

Salary and Commission

Our people know of this ad.

SW-9082, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

PROJECT ENGINEER

For public works, waterfront, and related projects. Must have had successful and proven experience in promotional contacts and detail management of engineering. Please do not apply unless you have sold projects in the past.

P-9045, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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(Classified Advertising)

EMPLOYMENT: BUSINESS: **"OPPORTUNITIES"** :EQUIPMENT :USED OR RESALE

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Replies are forwarded each day as received at each of the offices mentioned without additional charge.
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(Continued from preceding page)

SALES ENGINEERS—Albany, New York and Pittsburgh, Pennsylvania with established national concern selling prefabricated metal products to engineering and construction markets. Position offered is permanent and presents excellent future with aggressive, progressive and expanding organization. Engineering degree desirable. Previous sales experience unnecessary. Age 24 to 30. SW-8254, Engineering News-Record.

POSITIONS WANTED

CONSTRUCTION SUPERINTENDENT. Twenty-two years experience in industrial building, equipment installations and heavy construction. Engineering education. Know costs and Accounting procedures. Fifty years of age, married, no children. Seventeen years continuous employment with one Industrial Building Contractor. Available now. PW-9053, Engineering News-Record.

PROJECT MANAGER. Graduate Civil Engineer 25 years experience. Estimating, operation and administrative procedure of Sewage Plants, water Works, Sewers, Water Lines and Commercial buildings: West preferable. PW-9038, Engineering News-Record.

SANITARY ENGINEER — Age 39, married. M.S. degree, 7 years experience in sanitary engineering field including design, construction and administration. Desires responsible permanent position. Prefer far West. Registered CE in California. PW-8863, Engineering News-Record.

ADMINISTRATIVE ARCHITECT, 25 years experience, graduate, degree, registered. PW-8561, Engineering News-Record.

ENGINEER—15 Yrs. exp. desires position on design concrete or steel structures. Prefer part-time N.Y. or N.J. area. PW-8832, Engineering News-Record.

ENGINEER, REG. P.E. Reports investigations, settlement of contractors' claims. 45 years experience. Design, construction. Turnpikes, tunnels, buildings, foundations, etc. PW-8746, Engineering News-Record.

SAFETY ENGINEER: 17 years experience in engineering and as Safety Engineer on all types of heavy construction. Have ability to set up and co-ordinate successful safety program for large operation. Now employed, references. Desires to improve position. PW-9037, Engineering News-Record.

PROJECT MANAGER or General Superintendent desires connection with construction company doing foreign or domestic work. Broad experience heavy construction, organization, reorganization, administration and over-all management. Large well trained following. Highest references. Available September 15. PW-9000, Engineering News-Record.

WANTED—DYNAMITE work, 25 years construction experience, available at once. PW-8979, Engineering News-Record.

GEOLOGIST, SINGLE, 29, with PH.D. and varied experience, capable in soils, foundation, water, oil, and ores work. Desires permanent or temporary overseas position of any nature in Asia or Canada. May consider domestic jobs. PW-8994, Engineering News-Record.

CONSTRUCTION ENGINEER C.E. Graduate age 53 long successful administrative experience all phases large scale general construction and industrial chemical in field and office. Employed seeks new connection, top references. PW-8928, Engineering News-Record.

GENERAL SUP'T 25 years diversified heavy construction experience. Capable of assuming full responsibility on large job. Good background, know men and equipment. Good references. Available any location immediately. PW-9062, Engineering News-Record.

(Continued on the opposite page)

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Fully experienced in industrial and commercial buildings and mechanical installations (machinery, equipment, piping, etc.)

These openings in Cleveland Office offer excellent working conditions with paid vacations, sick leave and participating group insurance program. Presently working scheduled 5 day 45 hour work week.

Replies will be treated confidential and arrangements will be made to interview selected applicants. Please submit complete resume stating experience, education, salary required and date available to

THE H. K. FERGUSON COMPANY
Engineers and Builders
Ferguson Building Cleveland 14, Ohio

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EXPERIENCED CONSTRUCTION ENGINEERS
ASSISTANT PROJECT MANAGERS
PROJECT ENGINEERS
ESTIMATORS
FIELD LAYOUT
COST ENGINEERS

for assignments in Northeastern United States with large General Contractor. Permanent positions. College Graduates preferred. Forward resume of experience and references to:

P-9052, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

ESTIMATORS

Young engineers capable of mechanical estimating for construction of refineries, steam power and similar industrial projects. Must have some field experience.

Considerable weight given to ambition, intelligence and interest in estimating and cost analysis.

BECHTEL CORPORATION
220 Bush Street
San Francisco, California

WANTED

Construction Superintendent

For large industrial construction projects. Applicant shall have a successful background of employment with competitive contractors on lump sum projects. This is a permanent position.

P-9019, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

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Graduate, 42, married, healthy, energetic worker, 20 years experience in economic studies, design, construction all sizes hydro-power plants, also water resources, coordination with steam, Diesel plants, load distribution mines, smelters, electro-chemical, ceramic, cement, pulp plants in North, Latin America and Europe. Ability to deal with and handle officials and workers of all colors; fluent in Spanish, German, Scandinavian, also French.

Desires position involving travel anywhere with preferably international consultants and designers or utility. Employed on big hydropower construction at $12000 but salary secondary consideration if interesting, responsible work in congenial company.

PW 9075, Engineering News-Record
330 West 42nd Street, New York 36, N. Y.

PROJECT MANAGER—General superintendent, age 39, B.S.C.E., excellent health, 18 years broad industrial construction experience. Know cost, labor and customer relations. Interested permanent connection. Excellent references, good connections.

PW-9120, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

SEARCHLIGHT SECTION

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POSITIONS WANTED

(Continued from opposite page)

GRADUATE CIVIL Engineer desires position in Industrial Expansion Program. 5 years field and office experience as both a contractors' engineer and owners Resident Engineer on large industrial construction projects. PW-9105, Engineering News-Record.

C.E. GRAD, 29, married, varied supervisory experience steel bridges, deepwater bridge piers, VA hospital, housing project; super highway design. Seeks responsible permanent position with growing concern. Will also consider sales or municipal management. PW-9084, Engineering News-Record.

ARCHITECTURAL, STRUCTURAL Engineer experienced in industrial and commercial design, field-supervision and estimating desires position with Architects, Engineers, or Constructors. PW-8850, Engineering News-Record.

CIVIL ENGINEER—30, married, BSCE, MSCE, Reg. Prof. Engr., 7 yrs. design, construction, and administrative experience. PW-9096, Engineering News-Record.

CHIEF ESTIMATOR, heavy construction. Accustomed to responsibility office and field. Licensed P.E. Bidding, administration, cost control. Desire change with future with New York City Contractors or Consultants. PW-8961, Engineering News-Record.

ENG.-SUPERINTENDENT, over 36 years experience in all types of construction, 5 years Public Works, 10 yrs mgr. of housing projects, have built hospitals, Industrial bldgs and Rail road projects; familiar with all building costs, estimating, expediting and complete organization of large or small projects. Will travel. Available Sep. 15. PW-9068, Engineering News-Record.

CONSTRUCTION MAN with 24 years experience. Buildings and heavy construction, seeks new connections, thoroughly experienced field and office, speaks French, English, Spanish, Portuguese. Prefer foreign work—have spent 10 years Latin America, would accept permanent maintenance job. PW-9124, Engineering News-Record.

HIGH GRADE construction man, seeking new connection as project manager or similar position, solicits inquiries from General Contractors. Long and thorough experience all types buildings, heavy construction, docks. All details of contracting, bid to completion, both field and office. New York or vicinity preferred. PW-9122, Engineering News-Record.

CONSTRUCTION EXECUTIVE, proven record; Project Manager; Chief Estimator; Office and Field Executive. General Contracting. Available at an early date. PW-9118, Engineering News-Record.

CONSTRUCTION ENGINEER, age 36, graduate C.E. with varied experience, desires permanent connection with general contractor. Tidewater Virginia preferred location. PW-9116, Engineering News-Record.

MECHANICAL ENGINEER (Canadian) desires employment on West Coast of U.S.A. with Consulting Firm. 1950 graduate of University of British Columbia. 3 yrs. in Pulp and Paper Mill. Age 29, married, 1 child. PW-9115, Engineering News-Record.

SELLING OPPORTUNITY WANTED

SALES ORGANIZATION 15 yrs. experience wishes to represent A-1 manufacturer in New York area. Presently handling cement. RA-9036, Engineering News-Record.

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1½ yd. Lorain Shovel (1942).
Reconditioned in 1950.
Right price for quick sale.
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FOR SALE
Link-Belt K44, 60' boom,
completely rebuilt.
Northwest 105 backhoe with 32' crane boom.
Thomas C. Halliday, Jr. 1118 Wilcox Ave., N.Y. 61

FOR SALE
NORTHWEST BACKHOE
Model 25, with Caterpillar D-318 Diesel mounted on crawlers with 28" treads.
Excellent Condition.
GUY VILLA & SONS, INC.
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FOR SALE
Osgood 2½ yd. Dragline
Model 1007, Type 100. 80' boom, 40" treads.
Buda diesel engine.
Machine serial #5830 series.
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WANT BUY 200 TPH TO 300 TPH
Portable Crushing & Screening Plant
or 2—100 TPH to 150 TPH CAP.
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1004 SALEM AVE. HILLSIDE, N. J.

WANTED
Several McK-T 11 B 3 Pile Hammers
Stationary Air Compressors, 1000 CFM per unit and up, 100 PSI electric drive and controls.
Steam Boilers 60 to 70 HP each.
All equipment must be in good condition.
Advise availability, condition, point of inspection, price.
FOUNDATION EQUIPMENT CORPORATION
38th Ave. and Tenth St. Long Island City 1, N. Y.
Exeter 2-1100

WANTED
Used Model 866 Gradation Unit
For Barber-Greene Model 848 Asphalt Plant
Must be low in cost.
A. G. Sherwood Construction Co.
Independence Kansas

Wanted to Buy
#7 McKiernan-Terry Pile Hammer
in good condition
W-9114, Engineering News-Record
330 W. 42 St., New York 36, N. Y.

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Our 3 decades of diversified experience in rebuilding heavy construction equipment, quarry equipment and trucks, can be of invaluable help to you in rebuilding your equipment.
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L. B. SMITH INC.
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CAMP HILL, SUBURB OF HARRISBURG, PA.

L. B. SMITH INC.

New and Used Equipment News

Prepared Monthly by Ed Woolford at Camp Hill, Pa.

VOL. 2 NO. 5

AIR COMPRESSORS

Gardner-Denver 500 cu. ft. diesel, new condition.
Gardner-Denver 500 cu. ft. diesel, good operating condition.
Gardner-Denver 365 cu. ft. diesel.
Worthington two-stage, water-cooled, vertical 250#, 60 CFM, new condition.
Paving breakers, jackhammers, wagon drills, tie tampers.

QUARRY EQUIPMENT & BINS

2540 Cedarapids 4A primary unit, diesel power.
2036 Cedarapids AAA primary unit on rubber, diesel power. Rebuilt.
1036/2418 Cedarapids Jr. Tandem unit on rubber.
Cedarapids Rock-It plant w/2025 jaw, 3033 hammermill. New.
4033 Cedarapids Model 6C plant. New.
2020 Cedarapids double impeller. New condition.
4024 Cedarapids roll. Rebuilt.
3018 Cedarapids roll. Rebuilt.
10x7 Allis Chalmers lake type jaw crusher. Rebuilt.
B-3 Jeffrey swing hammer pulverizer. Rebuilt.
60" dia. x 14' long Traylor revolving screen. Rebuilt.
15 cu. yd. Cedarapids sand drag. New.
60-ton, 2-compartment, 8' x 18' storage bin w/clam gates.
100-ton, 2 compartment, 13'x23' storage bin.
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also belt.
24" Dia. x 30" face magnetic pulley.

TRUCKS—TRAILERS

1½-ton Ford with any body.
2000-gallon tanks on semi-trailer mounting.
New and rebuilt dump bodies.

GENERATORS & LIGHT PLANTS

1½ KW to 125 KW, alternating and direct current gasoline and diesel powered.

SHOVELS—CRANES

Lorain 77, 1½-yd. diesel.
Lorain 75B, 1¼-yd. diesel.
Lorain 57, 1¼ yd. diesel, rebuilt.
Lorain L-50-1, 1-yd. diesel.
Lorain 40 truck crane on Mack 3-axle truck.
Link Belt LS85 diesel combination. Rebuilt.
Unit 514, ½-yd. gasoline crawler shovel, rebuilt.
Lorain 30A, ½-yd. gas combination.

SHOVEL & CRANE ATTACHMENTS

Lorain L-41 Chain Crowd Shovel Attachment. Rebuilt.
Lorain 40 Hi-Lift shovel attachment.
P&H 203 shovel attachment.
Chain crowd Lorain 30A shovel attachment.
Bucyrus-Erie 1½-yd. rock bucket.
McCaffrey Model 648 for 1¼ to 2-yd. crane.
McCaffrey Model 636 for ¾-yd. to 1-yd. crane.
Lorain 77 crane boom, 45'.

BACKHOE BUCKETS & ATTACHMENTS

Lorain 30 hoe attachment complete.
¾-yd. Lorain, 40, LBS #6105. 44" cutting width.
¾-yd. Amsco 40" cutting width, LBS #8101.

CLAM—DRAG—SCRAPER BUCKETS

LIFTING MAGNETS

1—45" Ohio lifting magnet, rebuilt.

SHOVEL DIPPERS

Lorain 41, ¾-yd. LBS #8600, rebuilt.
Bucyrus-Erie 1¼-yd. gas air, LBS #3782, fair.
Lorain 75B, 1½-yd. manganese bucket, LBS #8538.
Lorain 75B, 1¼-yd. extended lip, 1¾-yd. LBS #2260.
Pettibone-Mulliken 2-yd. Lorain 82 or 820, manganese, LBS #5361.
Pettibone-Mulliken 2-yd. for 3500 Manitowoc LBS #5763.
Esco 2½-yd. cast weld dipper with bail & teeth.

CONCRETE EQUIPMENT

Blaw-Knox gas-electric finisher, 10½'-12½', rebuilt.
Koehring 10'-12' finishers, rebuilt.
Cleveland formgrader, new 1944 rebuilt.
Corr formgrader, new 1944, rebuilt.

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TD9 International diesel with 1 yd. Loadover.
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Sanderson-Cyclone #44 well drill, new.
Bits—Stems—Bailers—Sockets—Etc.

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New Layne Bowler type 18 deep well pump with right angle gear drive. 3000 GPM at 120' TDH.
Used and rebuilt pumps, all sizes, gasoline, electric or diesel.

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Murphy ME-6, rebuilt.
Caterpillar D8800.

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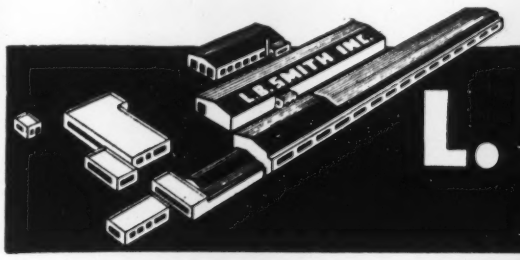

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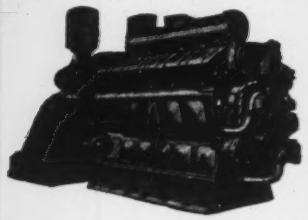

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1980	Nordberg	TS-217	2800	225	320	Enterprise	DSG-6	560	450
1136	Fairbanks Morse	38D	1600	720	300	General Motors	8-268A	450	1200
1100	General Motors	16-278A	1600	720	200	General Motors	8-268A	350	900
750	General Motors	12-567	1080	720	150	Worthington	CC-4	225	450
500	Baldwin	VO-8	750	514	150	Ingersoll-Rand	8-4	225	600
500	General Motors	8-278A	750	720	150	Buckeye	80	240	600
500	General Motors	8-567	720	720	100	Worthington	BB-5	150	600
480	Worthington	DD-8	700	360	100	General Motors	3-268A	150	1200
400	Ingersoll-Rand	8-8	600	720	60	General Motors	6-71	90	1200
350	Baldwin	VO-6	510	450	30	Internat'l Harvester	UD-14	45	1200

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Tel. STillwell 4-1030

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3—Whitcomb—15 Ton—36" Ga.—Diesel.
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2—G.E. 44 Ton—Heavy Duty Diesel Elec.—1951. Plymouth 30 Ton Diesel—Std. Ga. #4297.
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Brookville 8 Ton 36" Ga. Gas.
Brookville 6 Ton—36" Ga. Diesel.

2—HOPPER CARS—50 TON
SOUTHWARK 500 TON HYDRAULIC PRESS—HIGH-SPEED—LIKE NEW

2—Conway Mod. 75 Muckers, #256 & #305. Bargains.
Southwark 100 Ton Hydraulic Press.
Mundy 2-Drum Elec. Hoist—300 H.P. Like New.
Bridgeford Axle Lathe. 10—50 Ton Copper Cars.
Burro Model 30 Gas Crane.
Orton 30 Ton Diesel Locomotive Crane. Modern.

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Phone Sagamore 2-7132

1—637 CFM Chi. Pneu. OCE Comp. dir-connected to 125 HP syn. Motor, new 1944
1—45 Ton Clyde Whirley 100'B. 3/60/440V.
1—10 Ton Krane Kar Pne. Tires
1—20 Ton Ohio Steam Locomotive Crane
1—30 Ton Orton Diesel Loco. Crane
1—50 Ton Diesel Loco. Crane
1—20 Ton Browning Truck Crane, new 1951
1—35 Ton P&H 355 Truck Crane, new 1952
1—25 Ton G.E. Diesel Elec. Loco.
1—30 Ton Davenport Diesel Locomotive
2—44 Ton G.E. Diesel Elec. Locos.
1—45 Ton G.E. Diesel Electric Locomotive
1—100 Ton GMC Diesel Elec. Loco.

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Models 2000-B or 3500 — 25 T. to 60 Ton Capacity — 50' to 125' booms — 20' or 30' jibs — manual controls — independent booms — torque converters —

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1—3164 c.f.m. Sullivan Mod. WN-4 Compressor w/ 500 H.P. Syn. Motor, 3/60/2300 volt..... $24,000.

1—2500 c.f.m. C.P. Mod. OCE Compressor w/ 500 H.P. Syn. Motor, 3/60/2300 volt..... $22,500.

1—1100 c.f.m. Ingersoll Rand Mod. XCB Compressor w/ 250 H.P. Syn. Motor, 3/60/2300 volt..... $9,000.

1—1100 c.f.m. Sullivan Mod. WN31 Anglecomp Comp. w/ 225 H.P. Syn. Motor, 3/60/2300 volt..... $8,000.

Also other compressors, vertical type, 300' to 550' c.f.m.

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WILL CONSIDER RENTAL PURCHASE

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6 D8 CATERPILLAR TRACTORS—All excellent and above 2U16000 Series, 900 to 1500 Hours.

3 D8 Tractors—Rebuilt this Spring—2U8000 Series.

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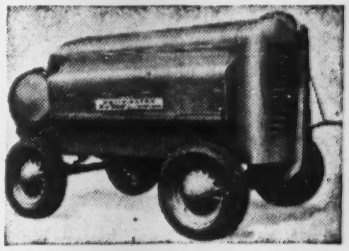

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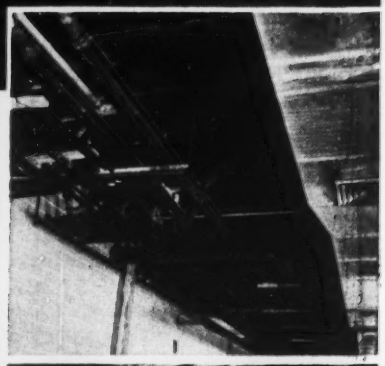
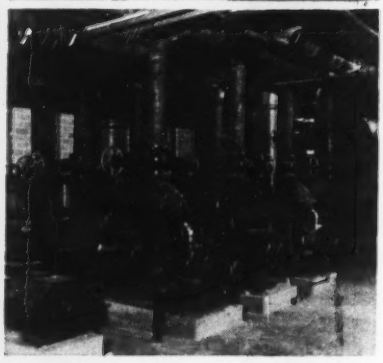




*

selects WROUGHT IRON PIPE to safeguard vital piping services against corrosion

Here's a clear-cut example of the old saying, "Practice what you preach!"

Schlumberger Well Surveying Corporation, known in the Oil Industry for the slogan, "The Price of a Schlumberger is Negligible Compared to the Loss of an Oil Well" applied the same basic principle to the selection of piping for their new Laboratory and Engineering Building, Houston, Texas. Rightly recognizing that the price of wrought iron pipe is negligible compared to the loss of production utilization caused by pipe failure, and the resulting repairs and replacements, the company used wrought iron in the hot water piping, downspouts and chilled and condenser water lines. Walter Kidde Engineers were consulting and construction engineers; Charles G. Heyne and Company, mechanical contractors.

Our booklet, *The ABC's of Wrought Iron*, gives complete details on the reason for wrought iron's ability to last longer, at lower cost per year. Write for your copy.

A. M. Byers Company, Pittsburgh, Pa. Established 1864. Boston, New York, Philadelphia, Washington, Atlanta, Chicago, St. Louis, Houston, San Francisco. Export Division: New York, N. Y.

BYERS

CORROSION COSTS YOU MORE THAN WROUGHT IRON

WROUGHT IRON

TUBULAR AND HOT ROLLED PRODUCTS

ELECTRIC FURNACE QUALITY ALLOY AND STAINLESS STEEL PRODUCTS

AS FAST as the crane can swing them from fabrication site to structure, the forms are set in place. Precambered, the girders require only tightening of end sections.

SEWER SYSTEM at Dusseldorf, Germany, used Hico girders to form concrete arch.

Hico knocks the props out

The Hico girder was designed to eliminate all of the disadvantages of timber shoring and also provide advantages not found in other types of hanging systems.

The new form support is adjustable for both length and stress. Intermediate sections are constructed in 2, 3 and 4-ft. lengths and are interchangeable to approximate roughly the span required. Slot and bolt end sections are extensible to provide fine adjustment variable from 20 to 26 in. and 24 to 33 in. The supporting platform of the girder is 6 in. wide.

One of the outstanding features of the girders is that it can be prestressed. Turnbuckles on the lower bar provide a method of cambering to correct for deflection. The camber—varying from ⅛ to 2 in. depending on the span—may be set at any time but this is done preferably at the time the complete girders are fabricated at the job site. The only equipment required for prestressing is a turnbuckle bar, a straightedge and a rule.

By incorporating the cambering feature, the designers of the girder have been able to slash weight considerably. Using scientific stress instead of bulk, the support weighs only 12 lbs per ft.

Used extensively throughout Europe for some time, the girder just recently has been made available in this country. One of the U. S. jobs that the system has been used on was in the construction of an interior ballistics laboratory at the Aberdeen Proving Grounds, Maryland.

Although it is not a large structure, experience with this building indicates that the Hico girder can be used at approximately half the cost of wood shoring methods. Cost computation was based on only nine subsequent uses of the girders, however. Actually, the girders are said to be reusable upwards of 100 times.

Because the building was designed to withstand the shock of explosions, the ceiling to be poured was 12 in. thick. Wood shoring necessary to support the 150-psf load would have created an impenetrable maze on the interior. As it was, a single line of intermediate shoring was required under the form joists because of the weight and length (about 24 ft) of the span. Camber was set at about ½ in. to account for deflection.

Jack Healy, Five Boro Construction Co.'s superintendent on the job, was quite emphatic in showing his preference for the new system. He reported that after his workmen became familiar with fabricating and erecting the girders, the work proceeded at a very rapid rate. Shoring was completed in a small fraction of the time required by usual methods.

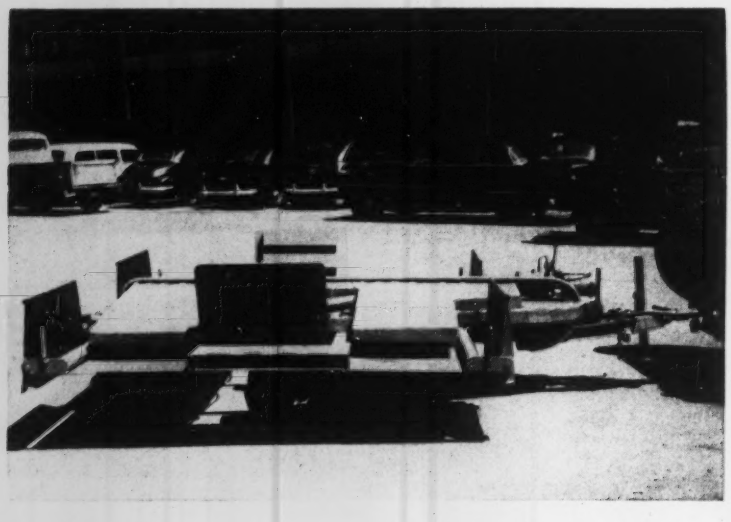
European applications of the girder have included shoring of concrete arches and other irregular shapes. This is done simply by connecting the girder segments to the rough shape of the form and adding sufficient filler pieces to round out the curve.

Design specifications for the girder will, of course, vary with the length of span and loading involved. The V-270, the type currently available in this country, will support 175 psf on a 17½-foot span when the supports are spaced 18 in. o.c. Maximum span length with a 25-psf loading on 18-in. centers is 29½ ft.

The Hico girder can be used also for ceilings built with various types of hollow bricks, or other prefabricated building elements, as well as ceilings of steel-reinforced concrete. For ceilings built with prefabricated building blocks, the girders are connected laterally by transverse or diagonal bars of either fixed or adjustable lengths. A fixed bar is available in 29½-in. length. Adjustable cross members are available in three sizes spanning 9¾ in to 63¾ in.

Stripping is accomplished by separating the girder at some central point and removing the resulting two sections.

Cost comparisons with other types of hanger systems would indicate that the Hico girder has a higher initial cost, but it is pointed out that this is more than offset by the reusability factor. Further, the adaptability of the girder to a number of forming situations plus the ease of erection have been reported to add up to substantial long range savings. WEBBIB STEEL CORP., 120 BROADWAY, NEW YORK, N. Y.



Overloaders beware!—mobile weigh station ahead

Lack of permanent scales need not be a deterrent to apprehending overloaded highway haulers—not that is, when a highway patrol is equipped with one of the new mobile weighing stations.

A new type of weighing station consists of a trailer frame and four ramp-mounted scales. The unit may be towed by jeep or patrol car and set up wherever desired by pushing a lever that lowers the ramp and scales to the pavement.

The weigh station is said to be ready for operation just as soon as the trailer portion of the unit has been rolled away.

The roadable station, the invention of an Ohio State Highway patrolman, supplants a method that required patrolmen to carry and set up four 87-lb scales with blocks to form ramps. While the officers were unloading and setting up the scales the concrete killers and asphalt assassins drove by unchecked. The manufacturer claims that state and municipal officials can now move and set up facilities equal to a permanent station in a matter of minutes.

The trailer ramp measures 4 in. high, 80 in. long and 96 in. wide, and with the ramp secured to the trailer the entire unit measures less than 30 in. in height. GLEDHILL ROAD MACHINERY CO., GALION, OHIO.

HYDRAULICALLY OPERATED back-hoe and front-end loader combination adds to the versatility of the Sheppard tractor. The Hopto Digger on the rear has a maximum digging depth of ten feet with a reputed capacity of 15 to 30 cu yds per hour in average soil conditions. The Baker-Lull front-end loader has a capacity of 1½ cu yds. Simplified fuel injection system on the tractor can be taken apart and assembled in a fraction of the time required for usual systems. Sheppard Diesels, Hanover, Penna.

Automatic rebuilder reduces maintenance costs

Designed to handle work up to 40 in. in dia, the Mir-O-Col K-2 welds 30 in. of bead per minute for fast rebuilding of wheels, pulleys, track rollers, idlers or cones.

Features of the K-2 include an adjusting wheel that permits fine vertical adjustments of $\frac{1}{64}$ in. and a gear reducer on the motor to vary spindle speeds from ¼ to 3 rpm. The machine will handle all types and sizes of automatic wire up to ¼ in. in size.

The equipment is also available in a twin-head model that will permit the handling of two jobs of different sizes at one time. For example, the twin head K-2 is said to enable one operator to rebuild a 40-in idler and a 24-in roller simultaneously. MIR-O-COL ALLOY CO., 312 NORTH AVE. 21, LOS ANGELES 31, CALIF.

Multi-zone air conditioners heat and cool simultaneously

A new line of air conditioning equipment has been designed to serve as many as 12 or 16 separate zones with a single unit. The conditioners are offered in four models with capacities ranging from 7,500 to 18,000 cfm.

During the cooling season when no heat is required, the heating coil and hot deck dampers act as a by-pass. During the heating season, the cooling coil and cold deck dampers assume this role.

However, both the heating and cooling coils can be left in operation throughout the year, if required, so that both heating and cooling can be obtained simultaneously for separate zones.

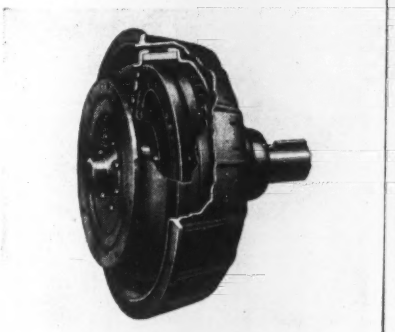
Designated Type B multi-zone air conditioners, the units are of the blow-through type. Air leaves the fan discharge and passes from the cooling and/or heating coil to the multiple zone damper section where it is discharged through as many separate air ducts as required for the individual zones. Mixing dampers for each zone act independently to provide specific temperature regulation for each zone and each separate air stream, whether it be for heating or cooling.

With automatic temperature control, a separate damper motor—pneumatic or electric—can be used for each

How Hydraulic Coupling Works in a Power Shovel

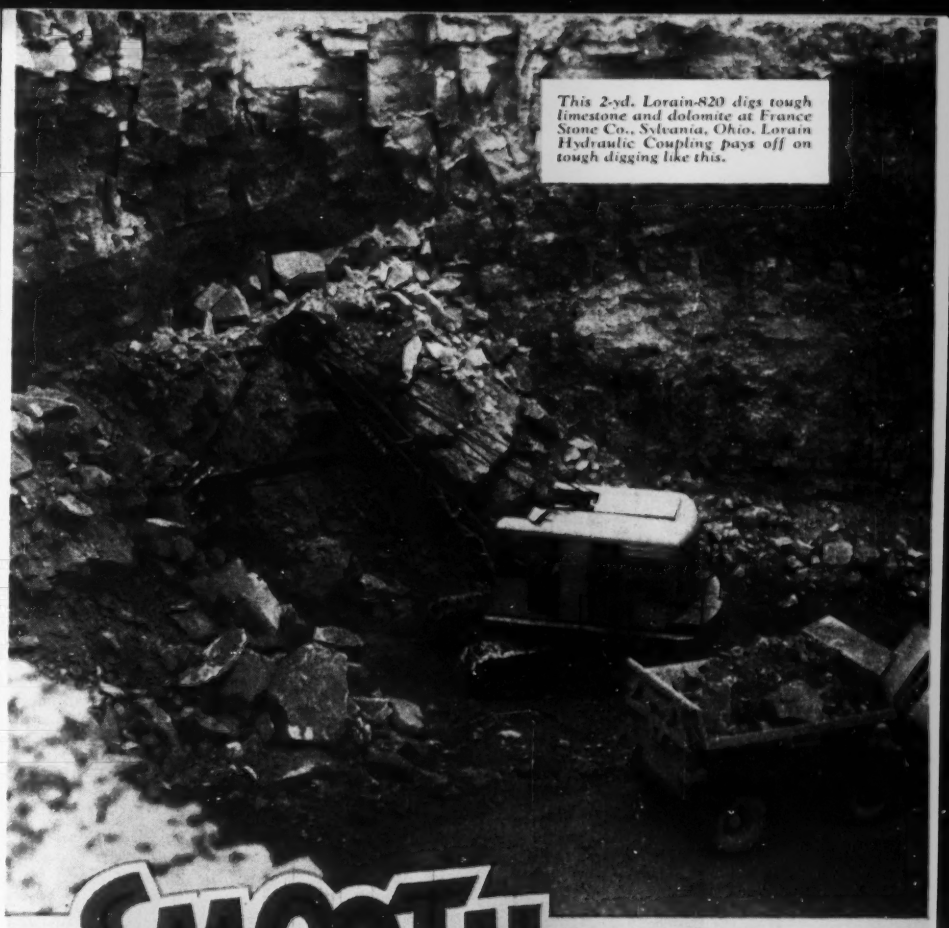
The hydraulic coupling type of power take-off has been proven over the years to add greatly to shovel-crane performance and life. It absorbs the impacts and shocks of hard digging, thereby reducing strain and wear on cables, machinery and engine, and it prevents the engine from stalling under any digging or lifting conditions — which is a time-saving, machine-saving feature. These many advantages are readily acknowledged by most shovel-crane men, but even some of those who like what a hydraulic coupling does for them, find it difficult to understand just how it works.

It is a load limit clutch that efficiently transmits full engine power



under normal conditions but "slips" when a shovel dipper, for example, is "hung up" on an immovable rock. This allows the engine to continue to develop full torque, with no abnormal strain on it, the machinery or cables. There is no shuddering to a standstill with stalled engine and the immeasurable strain this puts on the whole machine, as encountered with a friction type of take-off.

Even with a mechanical, band type of slip clutch, which is meant to provide shock relief, a maximum point of shock must be reached first before it becomes operative and is released. On the other hand, the hydraulic coupling has an infinite number of points of release, so to speak, which come into operation **before** the point of shock or overload is reached and not **after**. There is no surface friction, no mechanical wear, no overheating of parts. While it is mounted directly on the engine drive shaft, its "cushioning" effect would be as great no matter where it was located in the power train. It absorbs shock in both directions from itself thus giving protection from the dipper teeth to the engine. However, placed where it is, it acts on all phases of operation — hoist, swing, travel, crowd and retract.



This 2-yd. Lorain-820 digs tough limestone and dolomite at France Stone Co., Sylvania, Ohio. Lorain Hydraulic Coupling pays off on tough digging like this.

SMOOTH is the word when it's a *LORAIN-820* in rock!

Your eyes and ears can tell you what a beating your shovel takes in rock. It's a tough life — full of sudden shocks and impacts — that only the best design can withstand.

You will see a big difference in Lorain-820 shovel performance . . . the difference made by the use of Lorain's Hydraulic Coupling. This efficient fluid drive *smooths* out the shocks and impacts, *cushions* them before they have a chance to wrack and strain turntable mechanism and cables. Lorain's steady power keeps "hanging on" until the most unyielding rock is in the dipper — the toughest digging cannot stall the engine. Available air controls and air assist of crowd and travel operations make the operator's job smooth and easy. The net result — more rock in the trucks at the end of the day!

See a Lorain-820 in action. Ask your Thew-Lorain Distributor to show you the "smoothest" rock shovel you can buy.

IN ROCK YOU'LL GAIN WITH

THE THEW SHOVEL CO.
Lorain, Ohio

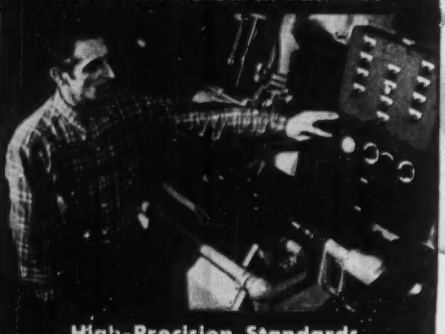
THEW LORAIN 820

You'll be far ahead of the field with

FORD INDUSTRIAL ENGINES!

Constant Engineering Advances

Matchless Research Facilities



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Mass Production Savings

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Experienced Ford Sales Engineers will gladly prepare recommendations for the efficient use of Ford Industrial Power in your application.

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Here's why—

These are hard-fisted facts that equipment manufacturers and users should know about!

As these pictures portray, the engineering and manufacturing facilities of the Ford Motor Company are unmatched in the field of Industrial Power. This has resulted in advanced features of engine design that are years ahead of the industrial field.

Let us mention just a few for example: Ford offers a choice of six engines varying in displacement from 134 cu. in. to 317 cu. in. in the popular range. Of these, four are latest design overhead valve, short stroke, low-friction, high-compression type, that deliver more actual power at the clutch than was formerly possible in any engines of comparable size. Features include precision-molded, fully counter-balanced crankshafts; full-flow oil filters; free-type, self-rotating valves; rigid, deep-skirt crankcase and many others. These advancements mean longer engine life and lower operating cost.

Every Ford Industrial Engine or Power Unit is a complete assembly, fitted with a long list of standard equipment *at no extra cost*. All are *thoroughly tested* before shipment and are *ready-to-run!* In a word or two, Ford Industrial Power provides unexcelled efficiency . . . not only more power per pound, but more power per cubic inch displacement at low piston speed.

We will be happy to send you descriptive folders with complete information. Why not write or . . . if necessary . . . wire us today?

INDUSTRIAL ENGINE DEPARTMENT

FORD MOTOR COMPANY

15050 Woodward Ave., Highland Park 3, Mich.

Nation-wide Parts and Service Availability

Ford

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set of multi-zone dampers. These motors are operated from thermostats located in spaces that are conditioned and served by the required zone. No summer-winter change-over is required since the dampers operate in the same manner and in the same direction for both heating and cooling.

The equipment is of sectional construction and consists of filter, blower, heating, coil, cooling coil and multiple zone mixing damper sections. All sections are bolted together and no external flanges or seams appear outside of the unit. Internal access to all sections is available through access panels. United States Air Conditioning Corp., 3300 Como Ave., S. E., Minneapolis 14, Minn.

LABORATORY accommodates three technicians.

Soils testing lab is truck mounted

A mobile soils lab has been designed for use in field testing for the design and control of construction for dams, levees, airfields, etc.

The laboratory is outfitted in a custom-built, van-type body. Electrical power is supplied by an automatic starting electrical plant; distilled water and wash water tanks are built into the body, and an air compressor and receiver are also mounted on the unit.

Benches, storage cabinets and working spaces are arranged to allow three technicians to work in the laboratory.

The unit is equipped to perform standard soil tests for: grain-size, liquid and plastic limit, specific gravity, field density, compaction, California bearing ratio, unconfined compression, load bearing and permeability. Special units can be equipped for consolidation and triaxial testing of soils, bituminous materials and concrete.

Use of the mobile laboratory eliminates the jerry-built and often inadequate temporary facilities erected in the field. The laboratory is supplied complete and ready for operation. Soiltest, Inc., 4520 W. North Ave., Chicago 39, Ill.

Rubber scraper blades protect mortar mixers

Muller Mixers are now available with rubber scraper blades as optional equipment. The blades have been developed to by-pass small pebbles that sometimes get caught between

FOUR-WHEEL STEERING and four-wheel drive shuttle car has a capacity of 1.75 cu yds or two tons. An HD-260 Continental diesel drives the vehicle at four speeds forward and four reverse from 1 to 20 mph. Overall dimensions are 6 ft 4 in. wide, 16½ ft long and 5 ft 9 in. high. The hydraulically operated dump box is available in dimensions necessary to adjust to specific conditions. Getman Brothers, South Haven, Mich.

BRIDGING THE COUNTRY

THE SUPERIOR BRIDGE DECKING FOR SMALL OR LARGE JOBS

★ 80% OPEN
★ SELF-CLEANING
★ SELF-DRAINING
★ NON-FLOAT
★ NOT AFFECTED BY WIND PRESSURE
★ LIGHT WEIGHT
★ STRONG, SAFE ROAD SURFACE
★ MINIMUM OF ROAD MAINTENANCE

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"A BRIDGE IS ONLY AS GOOD AS ITS DECK"

- Also gratings for bridge sidewalks and gutter catch basins.
- No accumulation of dirt or snow.
- For further information and engineering data ask for catalog.

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ESTABLISHED 1902

OFFICES and PLANTS at
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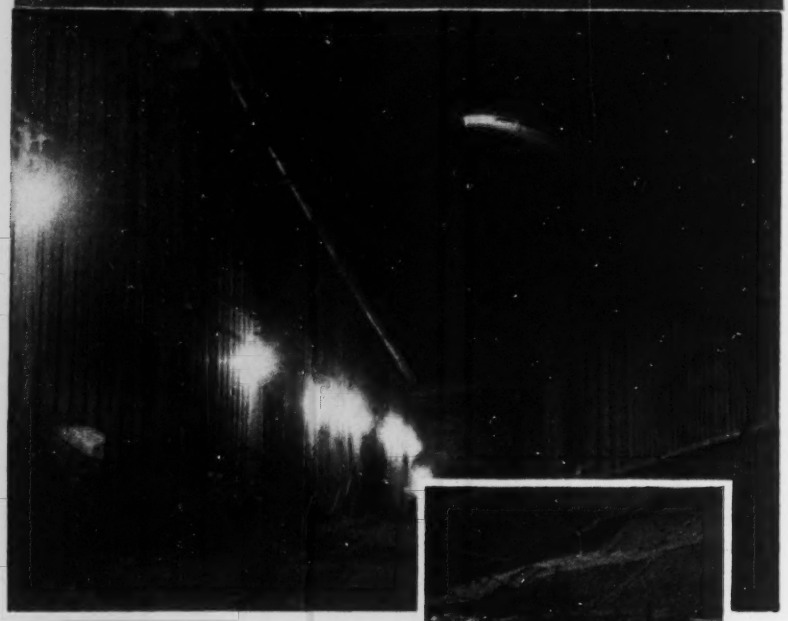
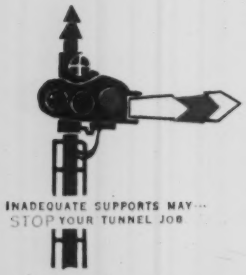
1863 10th St., Oakland 20, California

Erection Time Is Cut With
"COMMERCIAL" Steel Tunnel Supports



OPENED TO TRAFFIC ON SCHEDULE

You can see how close to the heading these "COMMERCIAL" steel tunnel supports are set into place. Because they are accurately and completely fabricated they are placed at the design line and quickly bolted into a lining which can add structural strength to the permanent lining. Steel supports have smaller cross section than timber sets and can be incorporated in the concrete lined area.



Substantial savings in tunnel excavation and concrete lining will result when steel tunnel supports are installed. "COMMERCIAL" prefabricated steel tunnel supports offer many other advantages which will assist you in realizing substantial savings and accelerated progress reports. Transition to steel supports before your heading is started is much less costly.

THE COMMERCIAL
SHEARING AND STAMPING COMPANY
YOUNGSTOWN, OHIO • CHICAGO, ILL. • SALT LAKE CITY, UTAH

the steel mixer blades and the inside wall of the drum. Besides the protection against damage to blades and transmission thus afforded by the rubber blades, the inside surfaces of the drum are kept polished for easy cleaning. MULLER MACHINERY CO., INC., LAKE AVE., METUCHEN, N. J.

Gas-shielded welder fills at double rate

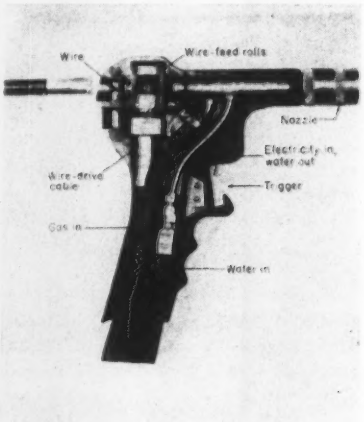
Fillerarc Welding equipment for the gas shielded welding process is said to enable the operator to double the deposition where filler metal must be added. In addition, the equipment reportedly simplifies control, decreases operator training time and reduces operating and maintenance costs.

Electrode wire of aluminum, stainless steel, mild steel, copper, magnesium, and other alloys may be employed with argon or helium shielding gas. It is claimed that the equipment can be used in down-hand, vertical or overhead positions to weld aluminum of any alloy from $\frac{1}{2}$ to 3 in. and stainless steel from $\frac{1}{8}$ to 1 in.

Fillerarc consists of three main components: a special self-regulating motor-generator type welder, a pistol-type holder and an electronic wire-drive unit.

The welder is designed to give constant arc length and produce any current required up to 450 amps. Machine settings are for arc length only—no current calibrations appear on the dial—and once set the operator can change wire feed without further adjustment.

Knurled feed rolls in the gun pull the electrode wire from the spool, rather than push it to minimize kinking in using 0.030 in. dia wire, the smallest diameter the gun will feed.



WELDING GUN is watercooled.

Maximum electrode wire size is 0.093 in. in dia.

The wire-feed speed can be adjusted from 0 to 750 in. per min by means of a remote two-speed switch, and the set speed is held constant by an electronic motor control in the wire drive unit. Trigger control enables the operator to obtain gas coverage automatically before and after the arc is struck, but it is not necessary to hold the trigger depressed during welding.

Operation of the 50-oz gun is reduced to three simple procedures. After the gun is positioned, the trigger is pulled to get preliminary gas coverage, then released to feed wire; the arc is automatically started as the wire touches the work. Operating the trigger again stops the feed and provides gas coverage as the weld cools. GENERAL ELECTRIC CO., SCHENECTADY 5, N. Y.

Moisture repellent paint has long service life

Brushed, rolled or sprayed on, a new asbestos coating for concrete and masonry surfaces is said to offer economies in maintenance costs because of its easy-to-keep-clean characteristics.

According to its manufacturer, the product has been tested for four years and has been found immune to extremes of heat and cold, fungus, ultraviolet and infrared rays, salt air, acids, industrial fumes and natural elements. Further, when properly applied, the coating reportedly seals the surface to prevent internal deterioration of the concrete or masonry base.

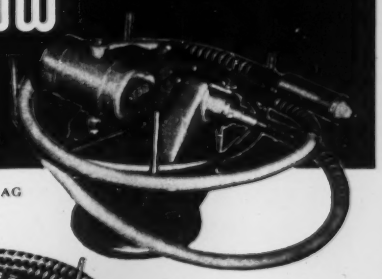
One gallon covers about 300 sq. ft., depending on the porosity of the surface. LOWEBCO, INC., 1525 E. 53RD ST., CHICAGO, ILL.

Aerated concrete can be nailed and sawed like wood

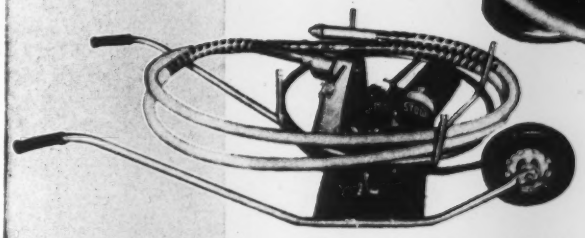
A process for making an aerated concrete building material has been imported from Europe and is now being produced and sold in the U. S. under the name of Calsi-crete. The material is said to be easily workable with usual woodworking tools but it is reputed to have structural and insulating values that are in some cases better than either wood or concrete.

A variety of densities is available from 15 to 55 lbs per cu. ft. with proportional structural and thermal insulating properties for each density. Calsi-crete weighing 15 to 30 lbs per cu. ft. is not recommended for load bearing applications but can be used

New performance features built into STOW CONCRETE VIBRATORS



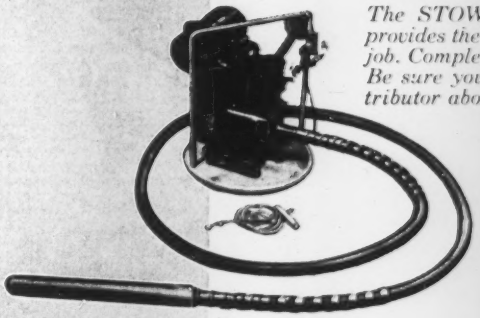
MODEL AG



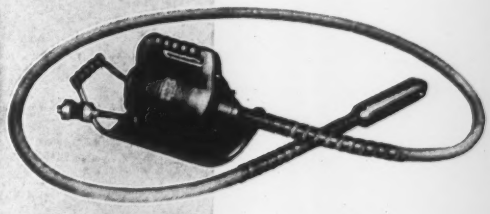
SHOWN: MODEL BGW. This is the standard STOW model BG vibrator, mounted on wheelbarrow for easy maneuverability. Model BG & BGW feature 2 HP 4 cycle, air-cooled engine; ball-bearing eccentric belt tensioner.

Contractors like STOW vibrators because the high operating speeds of this new STOW vibrator line make possible the use of heavy duty, light weight flexible shafting, and lighter, more efficient vibrator heads. And STOW design provides convenient speed control so that attachments for rubbing, grinding, cleaning may be used directly on the vibrator shafts, making it unnecessary to purchase extra shafts for this purpose.

The STOW line is complete . . . provides the right vibrator for every job. Complete accessories available. Be sure you see your STOW distributor about the STOW line!



MODEL J—The lowest priced vibrator in the STOW line. Slower speed means longer, trouble-free operation. Model J features 3600 (max.) VPM, 2 HP 4 cycle air-cooled engine, and direct drive.



MODEL BU—Features 2 HP at 9000 VPM, operates on 115 volts AC or DC with splash-proof, high speed ball-bearing motor.

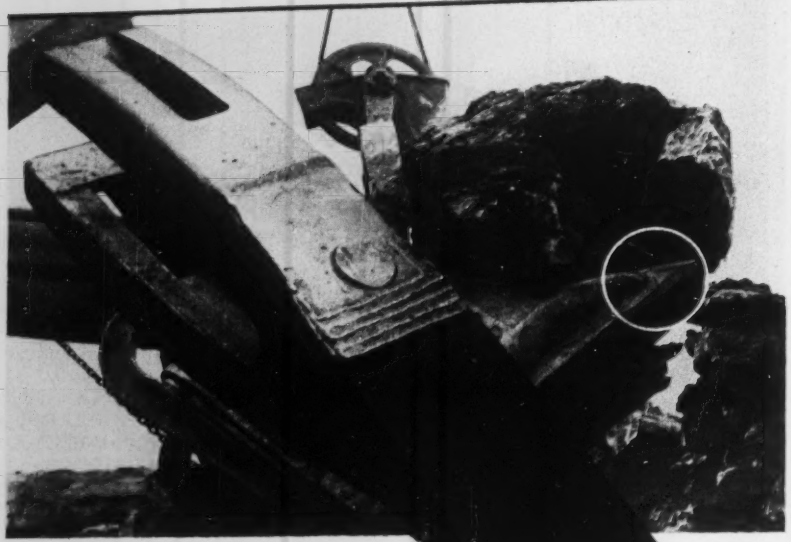
See how STOW can save money for you! Send for Free Bulletin 526,

STOW MANUFACTURING CO.
19 Shear Street, Binghamton, N Y

ANOTHER ESCO MONEY SAVER!

New 7" Box Point-

for rock shovels in the 6 yard class



ESCO R7R Increased point life 340% on one hard rock shovel job!

...fits any 4½ to 7 cubic yard shovel

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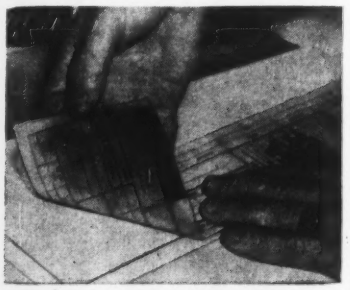

PRESSURE SENSITIVE adhesive and lettered plastic sheets are combined to relieve much of the routine work in the drafting room. Transeals, as they are called, are custom printed to individual customer's specifications, and may be applied to either side of the drawings. Johnson Research Corp., Bethpage, Long Island, N. Y.

PUBLICATIONS

Rubber bearings—A new catalog describes the use and advantages of Cutless rubber bearings in industrial equipment. It contains engineering data of interest to plant engineers, product and equipment designers and recommends the use of the bearings in various types of industrial equipment such as pumps, agitators and similar equipment where bearings can be lubricated with water or by the liquid handled in the equipment. LUCIAN Q. MOFFITT, INC., 333 SOUTH MAIN ST., AKRON, OHIO.

Plastic products—An 8-page booklet contains information on the complete line of Yardley plastic products. Included are plastic tubing, extruded gaskets, profile extrusions, injection molding and fabrication and Yardley ClearStream pipe and fittings. Bulletin No. 150. YARDLEY PLASTICS CO., 142 PARSONS AVE., COLUMBUS 15, OHIO.

Welding machines—More than 20 different models of arc welding machines are described in Catalog No. 1340. AC, DC and inert gas models are illustrated with complete descriptions covering specifications, features and electrical data. The 44-pager also includes sections on the accessories and electrodes required to perform a particular arc welding job. Also discussed are various types of running gear, foot controls and an automatic arc welding head. AIR REDUCTION SALES CO., 60 EAST 42ND ST., NEW YORK 17, N. Y.

Chlorine dispenser—Catalog 61 describes the new solution feed dry vacuum type Fig 1050 Ratochlor chlorine dispenser. The 12-pager gives specifications covering dispensing rates from 0.5 ppd to 1000 ppd. Also found in the catalog are illustrations of component parts, a flow diagram of the dispenser, and pictures and diagrams of chlorine dispenser installations. FISCHER & PORTER CO., 818 JACKSONVILLE RD., HATBORO, PENNA.

Conveyor idlers—More than 500 belt conveyor idlers in 34 types are pictured and described in a new 48-page book, No. 2416. Detailed information is provided for selection and spacing, based on weight and lump size of material to be conveyed. Schematic drawings and dimensional data are included for each type of idler. The idlers described handle belts ranging in widths from 14 to 72 in. LINK-BELT CO., 307 N. MICHIGAN AVE., CHICAGO 1, ILL.

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EDITORIALS

Overbuilt in factories?

PROGRESSIVELY over the past few years, as industrial building contracts have held at high levels, those construction people who try to gage the future—or merely worry about it—have been concerned with overbuilding. How can we replace existing industrial capacity with new—and lasting—facilities at such a sustained rate, they have wondered, and not soon reach a point where we have enough—or too much? If, as has been pointed out, 35% of the nation's industrial plant is new since the end of the war, they have reasoned that we have been having a boom. And booms are not infrequently followed by busts.

To those who have not been able to erase this gloomy picture from their vision, a recent economic study by the Machinery and Allied Products Institute should be welcome. The study concludes among other things that the nation's combined stock of plant and equipment is not excessive by historical standards, but of even more significance that the value of plant, as distinct from tools, is actually less per worker in 1953 than in 1930. There was $5,000 worth of buildings and structures per worker in 1930 and only $4,900 now.

Equipment per worker has, on the other hand, increased from $2,600 to $4,300 in the same period. Looking at this disparity, our colleagues in the McGraw-Hill department of economics, have come up with some possible reasons for it which, if valid, outline the problem faced by engineers and contractors in the industrial building field. Thus, it is believed that more efficient use is being made of existing plants by installing continuous processes that save space by keeping materials on the move instead of storing them; and that some of the newer industries, such as chemical and petroleum, use outdoor plants that require very little structure.

These conditions are rather on the negative side so far as plant growth is concerned. But two other reasons cited for the faster pace of equipment as compared with plant are just as strongly positive. They are that improvements in plant design have not measured up to those in tool design. And that the availability of better tools has caused manufacturers to make their old plants do rather than build new ones, and thus conserve their money for investment in tools to meet their more rapid obsolesence.

The big problem, then, for the industrial plant builder is to develop structures that will compete on a value-returned basis with the tools that are being offered.

Since the investment in plant per worker is far from inflated, there need be no concern on this score. And since markets for the products of factories are increasing at home (where the population reached 160,000,000 last month) and abroad (where our wares are growing in popularity), industrial facilities cannot, in fact, be allowed to lag. Thus, not only are we not overbuilt in factories, but the opportunities for increased business in industrial construction continue to be good.

Headquarters for engineers

MORE THAN JUST A SITE for a building is needed before the major engineering societies will abandon their present headquarters in New York, either for another location in that city or for a new home elsewhere. That observation by John H. R. Arms, secretary of the United Engineering Trustees, emphasizes the major financial problems faced by the societies in their current efforts to secure improved and enlarged headquarters facilities whether in New York or in some other city.

A site for a new headquarters building in Washington has been offered; reports from Chicago last week indicate that a group there is preparing to offer a site in that city (ENR Sept. 3, p. 23), and an offer is expected from Pittsburgh. But as Mr. Arms points out, unless these offers of sites are accompanied by provisions for a building of adequate size or funds to cover most of the cost of such a building, the trustees will still be short of their needs. Funds available from sale of the present building and possible cash contributions from the societies will not construct the kind or size of headquarters that is required.

It is, however, quite possible that aid of adequate scope may be offered. Then the big question that the societies may have to face is whether to move to Washington, Pittsburgh, Chicago or some other city making an attractive offer.

That the answer will not be reached easily is evident in a statement by Willis F. Thompson, one of the trustees, to the effect that a final decision must rest on what is best for the societies, not wholly on what physical facilities are offered by a particular city to attract the societies. The question of what location best meets the need of each society could divide them hopelessly, although the general feeling is that the officers and memberships of the societies would approach the question with a fair and open mind, and with due regard for the best interests of engineering as a whole.

The speed with which a decision could be reached also may prove to be a controlling factor, for offers of sites for a building and funds with which to build cannot be left open indefinitely. Commitments to contribute to a fund for such a purpose generally are closely limited as to time, especially big gifts from large corporations such as would be needed for such a project. All of which leads to the conclusion that if attractive offers do materialize, the directors of the major engineering societies have very serious work laid out for them in the months immediately ahead.

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111-A

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Timken bearings take the tough shock loads because they're case-hardened to give a tough, shock-resistant core and a hard, wear-resistant surface. Their tapered construction enables them to take both radial and thrust loads in any combination. Drums are held in rigid, positive alignment. Wear is minimized.

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No other bearing gives you all the advantages you get with Timken tapered roller bearings. Make sure they're part of the equipment you build or buy. Look for the trademark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

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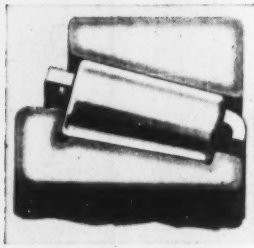

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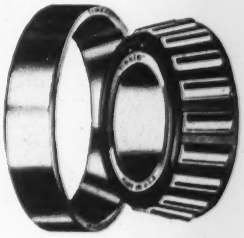

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